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SURGERY UPON THE LARGE INTESTINE: A GENERAL CONSIDERATION AND REPORT OF A SERIES OF CASES.*

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Recently I published a paper entitled "Malignant Diseases of the Sigmoid and Rectum" (*New York Medical Journal*, January 29, 1910), in which I reported a series of thirty-two cases involving the sigmoid, rectum and anus. As that paper includes the operative technic, etc., in low sigmoid, rectal and anal cases, no consideration of the formation of a permanent artificial anus, nor the various methods of excision of the lower sigmoid, rectum and anus will be essayed in this article. In this article I shall report twenty-one cases of surgery of the large intentine irrespective of malignancy, and include eight cases of upper sigmoid malignancy reported in the paper previously mentioned. I am including these eight sigmoid cases to enable me to fully consider the operative technic in these lower colonic or upper sigmoid cases, using the term upper sigmoid in contradistinction to what we are now pleased to call the lower sigmoid, and formerly the intraperitoneal rectum.

There was one case of megalocolon—Hirschsprung's disease—in a lad eight years old, with complete excision of the colon and upper sigmoid. There were eight cases involving the cecum, one of tuberculous ulceration and infiltration of the cecum, with permanent sinus after an exploration for an appendix; one of excision of the cecum for old infiltrating sinuses of nine years standing, following a spontaneous rupture of an appendicular abscess; six of carcinoma of the cecum, three of which were excised with two deaths, and three in which entero-sigmoidostomy was done with one death; one case of general colonic malignancy in a boy seventeen; one case of carcinoma of the descending colon and sigmoid in a female eighty-five years old; one colloid carcinoma of the terminal three inches of the descending colon.

The ages of these patients varied from seventeen years in the boy with general carcinoma of the large intestine, to eighty-five years in a female patient with carcinoma of the descending colon and sigmoid. There were nine males and eleven females, with one case in which the sex is not stated.

One of the cases reported as a carcinoma of the cecum (no specimen examined, but clinically the conditions were typical of carcinoma), a female of thirty-five in whom I did an entero-sigmoidostomy about seven and a half years ago, I am inclined now to believe was exudative, cause unknown, or maybe one of those occasional malignancy cases that subside after exposure, as she has gained over forty pounds in weight since her operation. But, upon examination one year ago, with all her improvement she still had evidence of a tumor at the old site, about a quarter the original size.

Diagnosis.—In the early onset the symptomatology is sparse, and so vague and indefinite that a diagnosis is rare or difficult. The earliest symptoms that we observe are borborygmus, crampcolic pains, alternating diarrhea and constipation, feeling of incomplete emptying of the bowels, the discharge of mucus, blood and pus, singly or combined, localization of pain by the patient, or a painful spot on pressure, and finally the location of a tumor—movable or not, depending on the section of the colon involved. When low in the sigmoid, or even within twelve to eighteen inches of the anal orifice, proctoscopic evidences may be obtained. A continuously slowly or a rapidly decreasing weight, barring such weight-depreciating diseases as diabetes, etc., would with the above symptoms be an almost positive factor in the diagnosis of a malignancy of the colon.

In the patient with colloid carcinoma of the transverse colon, in addition to an occasional localized pain near the site of the growth, he gave such evidences of an appendicitis when I saw him as to mislead me in my diagnosis and operation. This was due to spasms of the gut in attempts at emptying itself, producing a back-tracking of the contents to such a degree as to produce appendicular colic and profound distension of the appendix This condition was beautifully demonstrated upon opening the abdomen. The appendix was enormously dilated with liquid feces and gas, while the colon and cecum were only about normal in size.

* Read before the Surgical Section of the N. Y. Academy of Medicine, February 4, 1910.

Operative procedure resolves itself into resection with anastomosis or short-circuiting. While the latter is not curative, and is only a makeshift surgical procedure, nevertheless it must be considered in those cases where the mortality risk is a great factor from a family provider's standpoint, i. e., when the mutilation or insult to the patient's tissues, due to marked involvement, but probably still removable growth, would be so extensive as to place removal in the class with a high mortality rate as compared to the low one of an anastomotic short-circuiting. In these it should be chosen to give the patient an opportunity to prepare a financial outlook for his or her family. Then again such procedure is frequently followed by a subsidence of the infiltrate and tumor to such a degree as to make resection less hazardous.

Excision of the growths.—Here several anatomical and physiological considerations must be dealt with, chief of which are the vascular and lymphatic supplies, the ureters and the relative absorbing functions of the colon.

Regarding the ureters, one must remember their association with the peritoneum in excising the cecum and sigmoid.

Vascular supply.—For excisions of the cecum in malignancies it is well to bear in mind the statement of W. J. Mayo in his classical article in the *Annals of Surgery,* July, 1909, page 205, "That the terminal six inches of the ileum has the same blood supply and lymphatic drain as the cecum through the ileo-cecal vessels. For this reason, in all cases of malignant disease of the cecum the terminal six inches of the ileum must be excised. That in the removal of the sigmoid one must bear in mind Moynihan's gland in the angle of origin of the inferior mesenteric artery. That in malignancy of the ascending colon, owing to the vascular supply and lymph drainage one must also excise the cecum and the distal six inches of the ileum."

The glandular enlargement was well marked in one case of cecum excision, that of the male twenty-five years old, a gland fully the size of an English walnut being found close to the origin of the colica dextra.

In excising growths of the transverse colon and the hepatic and splenic flexures one must search for the glands in the transverse mesocolon and in the pancreatic area. Before exposure of the growths by abdominal section, palpation per rectum may reveal the so-called Blumer shelf. While this is usually due to cul-de-sac implantation metastases in gastric carcinoma, it may also be present in the higher gut invasions, or it may be of general tubercular peritoneal origin. Its presence will aid in the prognosis, etc., and will usually condemn radical interference. If upon exposure of the abdomen liver metastases are in evidence, radical removal is also contraindicated.

The absorbing factors of the colon must be borne in mind, for if almost 50 per cent. of the fluids and 10 per cent. of the solids are absorbed by the cecum and the colon proximal to the splenic flexure, unless one believes in the arguments of Mr. Lane, the saving of as much as possible of this portion for anastomosis in cases of malignancy of the transverse colon and splenic flexure is decidedly essential. This statement may be questioned, as anastomoses between the sigmoid and cecum have been placed under a ban by some. My personal experience in the cases has been most satisfactory, none of them having been followed by any serious after-effect in so far as coprostasis in the upper portion of the blind pouch is concerned. The removal of any part or all of the colon is easily accomplished if one but remembers that the outer fold or plate of peritoneum covering the colon is the hold-fast, and contains no vessels, while the inner or mesial plate contains the vessels and lymph channels, all of which tend to the median line. Bearing these facts in mind one need but incise the outer plate or fold, which will allow the colon to swing on a long mesentery to the median line. The vessels can be picked up readily, as they come into the visual field very pronouncedly. In the splenic region one must remember the costocolic ligament, cutting which allows this angle or flexure to drop downwards into the operating field. These conditions were particularly well demonstrated in the case of Hirschsprung's disease, in which I was compelled by reason of great distension and hypertrophy to excise the entire colon to the lower sigmoid.

Anastomosis.—Personally I am in favor of, and have practiced, the side-to-side isoperistaltic anastomosis more than the end-to-end suture, having always felt that my field was kept more sterile, that I could invert the ends and make a lateral suture more quickly, and that the danger of leakage was less than in the direct end-to-end suture.

I believe that the resection cases are better handled in case of obstruction in a two-stage procedure, as the preliminary artificial anus or short circuiting gives one not only a cleared out bowel to work upon, but one also in which the two ends have become more nearly equal in both the lumen and wall thickening. Furthermore, the two-step operation leaves one with a protecting vent, while the suture ends unite—with no strain endangering their continuity. The two-step operation is not necessary when complete obstruction is not evident, as the patient can be prepared for a day or two before the operation, if thought necessary.

Removal of Cecum.—This was done three times for carcinoma, once for tuberculous ulcer and infiltration, with an old sinus following an operation for appendicitis three years before I saw her, and once for an old (spontaneously ruptured appendicular abscess) sinus in a patient who came under my observation nine years afterwards. In these five cases of excision two died, one man twenty-five years of age, with a lateral anastomosis by suture of the ileum to the transverse colon, and the other in a male under forty-four, with the same operation. In both cases autopsy was refused, and the causes of death after the sixth and eighth day, respectively, were conjectural. The third removal for carcinoma was in a female of sixty-seven, with ileo-sigmoidostomy by means of the Murphy oblong button, who lived almost three years, dying finally of general carcinosis. The tuberculosis case died some two and a half years later from a general tuberculosis, having made a most excellent primary recovery after a button anastomosis of the ileum to the side of the transverse colon. The appendicular case has made a perfect recovery, with a lateral suture of the ileum to the transverse colon.

The patient with colloid carcinoma of the transverse colon was so interesting in his history that I append it herewith:

J. L. L., 33 years of age, suffered for eighteen to twenty months with attacks of indigestion and cramp pains. There was a loss in weight of thirty-five to forty pounds. He was sent to me on November 16, 1907, with no record of loss of flesh, and only a brief history of spasmodic pains in the abdomen, simulating a gall-bladder or a mild appendix attack. At this time he had a temperature of 100°, a pulse that was 80-84, and no point pressure anywhere in the abdomen except over the appendix. There was no history of any associated trouble in the abdominal cavity which would point to the conditions found at the subsequent operation. He had been under the care of some of the best internists, and a diagnosis of gall-bladder and appendix invasion had frequently been made.

A Kammerer incision was made, and the appendix removed. It was seven inches long and about a half inch in diameter, the lumen widely distended and its coats thin and adherent in the pelvis. No evidence of intestinal obstruction or intestinal disturbance was found at this time. The patient was relieved from all abdominal symptoms for a period of three days, and stated that he felt better than he had done for months. Movements of the bowel were obtained until the fifth day, when he began to be restless and showed some marked evidences of abdominal cramps, the center of the disturbance being near the splenic region. It was evident at this time that some gross lesion, obstructive in nature, was present, and I suspected it was in the large intestine. The patient was observed for another twelve hours. He then began to vomit fecal material, and was immediately submitted to operation for intestinal obstruction. The stomach was washed out and the abdomen was rapidly opened. The site of obstruction was found to be proximal to the splenic flexure, proving to be an anular growth at this region, about an inch in length, and completely surrounding the colon. Owing to the distension of the small intestine an enterotomy was done, and the intestines were stripped and washed with salt solution. The opening was sutured, and then the sigmoid attached to the cecum by means of a Murphy button. After the sigmoido-cecostomy was done the patient's condition was such that we deemed it inadvisable to remove the growth, and deferred it to a later day. The patient was put to bed in a condition of collapse. The button was passed on the eighth or ninth day, and he was discharged from the institution in the third week, refusing to have the excision of the growth done until he had recuperated by going away for a short time.

He finally consented to have the tumor removed on February 29th, 1908, a little over three months after the second operation. At this time the growth was exposed without any difficulty, but it was observed that it had increased to almost twice its former size, and a few glands were evident in the mesocolon. Because of the invasion of the glands, the ascending and transverse colon were excised to the beginning of the descending colon, the free ends being simply turned in and left as blind pouches. The patient made a speedy recovery, and one year ago had gained thirty pounds in weight. He had previously gained twenty pounds between the second and third operations. Up to to-day he gives no evidences of recurrence, nor any symptoms which might point to recurrence. The tumor was reported as being a colloid carcinoma. Two years lacking three weeks have passed since this patient's third operation.

It will be observed here that this patient has two blind pouches, that of the ascending colon and that of the descending colon, above the point of anastomosis, and without any ill results.

Descending Colon.—In one patient, a male of forty-three, owing to marked involvement of the loin and upper iliac fossa, short circuiting was decided upon rather than removal. An anastomosis was made between the transverse colon and the sigmoid, low enough to be well away from the tumor. This patient was operated upon during the past two months, and is to resubmit himself to me within thirty days for examination, to determine whether a secondary removal will be advisable and possible.

The patient eighty-five years of age was a female, suffering from complete obstruction for nine days, complicated with chronic Bright's disease, and was comatose. In this case a right sided colostomy was done, with the result that she is now living some thirty-four months after the operation.

Of the sigmoid cases there were two excisions with Murphy button anastomoses; one with direct suture subsequent to the formation of an artificial anus for acute obstruction; one with excision and

lateral anastomosis with an oblong button—death in two days, septic; one excision with cecal anastomosis by means of a large round button, in a woman, twenty-two years of age, with cystectomy of the left ovary, operated upon two years ago—patient still in excellent condition, and no coprostasis in the blind pouch consisting of the ascending, transverse and descending colons.

I feel that had I made a preliminary artificial anus in the one fatal case, the patient being moderately distended, that I certainly would have secured a recovery.

60 WEST 52D STREET.

A NEW METHOD OF INTESTINAL ANASTOMOSIS, WITH REPORT OF THIRTEEN CASES.

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The secret of success in an intestinal anastomosis depends upon bringing serous surfaces into contact so that by inflammation intimate adhesions are formed between the two cut edges.

The ideal method of making an anastomosis should re-establish the continuity of the intestinal canal in its natural physiological axis, without constricting its lumen and without causing adhesions between the anastomosed segments and the different organs contained in the abdominal cavity. An end-to-end anastomosis would accomplish this were it not for the many difficulties which present themselves to the surgeon in making it.

The intestine is entirely surrounded by peritoneum except where the mesentery, by dividing in two leaves, forms a triangular space where there are no serous surfaces. It is difficult to close this dead space in such a way as to bring serous surfaces in contact and so avoid leakage of the intestinal contents.

Often the surgeon has to deal with two segments of intestine of different caliber, a condition which compels him to resort to artifices which render the operation more difficult, more dangerous and requiring much more time.

To obviate these difficulties surgery has devised an ingenious plan, viz., lateral anastomosis. But the procedure is not a simple one; in fact, it is a triple operation, that is, it is necessary to close the two segments of the resected gut (two distinct operative procedures) before accomplishing the third one, the anastomosis. The entire operation is lengthy and the dangers incurred, either from faulty technic or infection, are threefold.

It may be argued that statistics prove that the results of the operation are very satisfactory, but we must keep in mind that these statistics are based upon the results obtained by the very best surgeons whose ability and surroundings enable them to be successful with almost any method. If we could obtain the reports of surgeons and practitioners who have neither the training nor the opportunity for doing much intestinal work, statistics would not be so favorable.

The reasons why lateral anastomosis is preferred are: It leaves a positive blood supply, and in good hands it is safer than end-to-end junction, because it eliminates the dead spaces from the anastomosis; there are no difficulties in approximating large serous surfaces; the caliber of the intestine is of no importance.

But let us not forget that even the best surgical ability cannot eliminate nor at times even lessen the faulty conditions created by this procedure. It is only necessary to remember that the formation of two culs-de-sac is absolutely foreign to normal physiological conditions, and only too often the anastomotic opening narrows, producing all the disagreeable symptoms every surgeon knows, until another operation is necessary in order to obviate the danger of a complete occlusion. It is practically impossible to determine which is the proximal and which the distal end. Even in the best hands adhesions form between the anastomosed gut and the different abdominal organs. In emergency cases the life of the patient is often in danger on account of the length of time required to perform the operation so that lateral anastomosis is impracticable.

It can be readily seen that surgeons had to resort to lateral, on account of its being safer than end-to-end anastomosis, as made by the methods now in vogue, but if they had a method rendering the end-to-end as safe as the lateral anastomosis the latter would be abandoned.

The method which I beg to present, does, in my belief, eliminate all of the inconvenience attributed to the end-to-end anastomosis and by being the most rapid (more rapid in fact than all mechanical devices), very easy and simple it eliminates the danger common to every other method of anastomosis, namely, long manipulation of the intestine which makes infection more apt to occur and causes trauma, which facilitates the formation of adhesions.

The method has been used by Drs. George Keenan, A. S. Sullivan, J. F. Summers, Franz Torek, James P. Tuttle (to whom I extend my best thanks), and myself in 14 cases in human beings which will be reported later, after it was used, always success-

fully, over 200 times on dogs at the Surgical Research Laboratory of the College of Physicians and Surgeons of New York, (the privilege of working there having been very liberally extended to me by Dr. J. W. Draper Maury, for which I desire to express my appreciation). Dr. A. S. Sullivan not only has been my invaluable assistant during my experimental work, but has been, with Dr. Keenan, the first to use the method on human beings.

This is a suture method in which the cut ends of the intestines are sutured and inverted over a rubber tube. The size of the tube should be one-

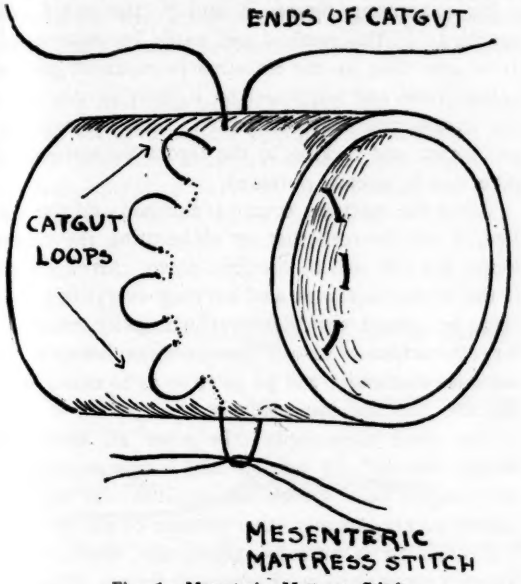

Fig. 1.—Mesenteric Mattress Stitch.

third less than that of the intestine to be anastomosed, and of about the same length as its diameter. Any tube of soft resilient rubber, about ½ mm. in thickness can be used. It is prepared in the following manner: A plain cambric needle is threaded with catgut No. 3. Going through the entire thickness of the rubber, a circumferential stitch is made at the middle of the tube, going in and coming out at about 2 mm. In this way a series of external loops is formed which loops should be about 2 mm. high. Figure 1 explains better than any description the way of preparing the tube. The two ends of the catgut are left about 10 cm. long and should be separated about 2 mm. so that when tied they make a loop, as explained later.

Having prepared the field of operation in the usual manner, we proceed as shown in Figs. 2 and 3.

For convenience in demonstration, the operation will be divided into three stages.

I. Reunion of the mesenteric angles (dead spaces) of the two segments of gut. (Fig. 2.)

A plain round straight or curved needle threaded with silk or linen is passed from within the lumen of either of the two segments of the intestine through the whole thickness of the gut and mesentery, traversing the dead space at a distance of about 3 cm. from the cut edge, avoiding, of course, any bloodvessels. The end of silk or linen is held by an artery forceps. The needle is then passed through any one of the catgut loops of the rubber tube: then, going to the other segment of the intestine, on the same side, it is passed from without in through the mesentery and intestinal wall, again traversing the dead space. The needle is then brought out again

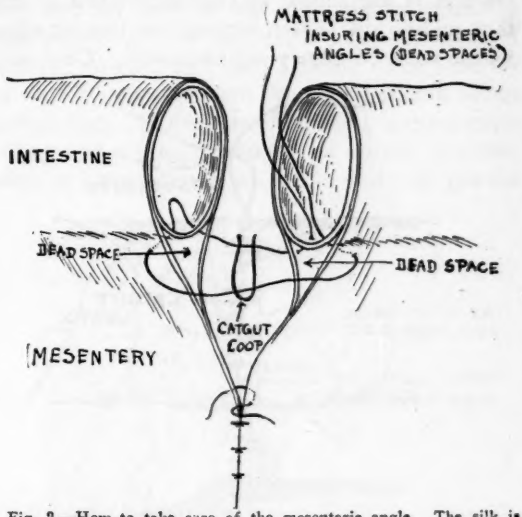

Fig. 2.—How to take care of the mesenteric angle. The silk is knotted inside of the gut and ends passed outside to be continued as mattress stitch.

through intestinal wall and mesentery, and going back toward the first segment of intestine it is passed under the same catgut loop of the rubber tube, and finally passing through the mesentery and intestinal wall, will come out in the inside of the intestine at a distance of a few mm. from the point of beginning of the stitch. It will be noted that the dead spaces have been traversed four times.

The two segments of the intestine are approximated and the two mesenteric angles (dead spaces) are securely closed by gently tying the two ends of silk, the knot being in the inside of the intestine. The two ends of silk are left long, one being held by an artery forceps; the other, armed with the needle, will be brought outside of the intestinal cavity by passing through the whole intestinal wall, close to the attachment of the mesentery and is used for the circular mattress suture of the second stage.

II. Continuous Mattress Suture. (Fig. 3.)

The two segments of the intestine are brought over the rubber tube and held in place by one or more temporary stitches, which pass through a catgut loop thus preventing the tube from slipping and facilitating the circular mattress suture; the

temporary stitches should be cut very close to the knot. The catgut loops stand prominently between the two cut edges of the intestine. The needle is passed through the catgut loop near the attachment of the mesentery, close to the mesenteric angle, and at about 2 mm. from the cut edge of the opposite segment of gut a continuous mattress stitch is begun; the needle goes through the whole thickness of the intestine. As the needle passes from one segment to the other it goes through the catgut loops, the serosa is inverted with each stitch, by tucking it under with a thumb forceps, and gentle traction is maintained so that each stitch is kept taut, and no silk is seen between the two cut edges which must be closely approximated. Care must

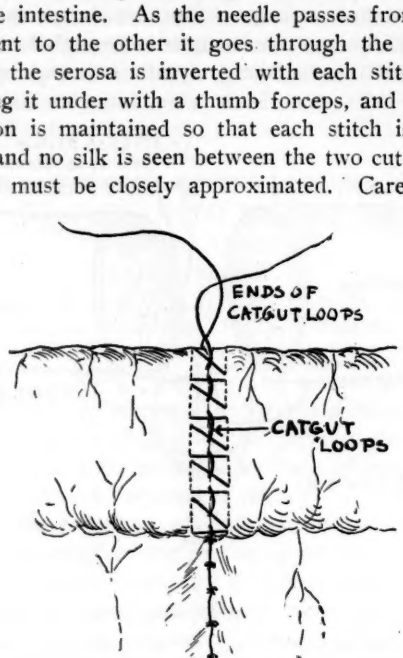

Fig. 3.—Tube within the gut; showing how mattress stitch is passed through the loops.

be exercised not to pull the silk perpendicularly to the intestine because by so doing it always tears the gut: The traction on the silk must be made keeping it parallel to the suture line. (Figs. 4 and 5.) When the circular mattress stitch is completed the silk is knotted to the end which was held by the artery forceps and the ends are cut close to the knot. The temporary stitches can be cut off when they are reached with the circular suture.

One needs not to be particular as to the regularity of the mattress stitch; the only important points are: to pass the silk under a catgut loop at least once, when going from one segment to the other and to invert the serosa, keeping the silk taut.

III. Traction of the Loose Strands of Catgut.

The intestine is washed with normal saline solution, and clean pads and towels are put around, then the anastomosed gut is taken in one hand and one strand of the catgut is gently pulled until about half of the loops has disappeared, then the other end is also drawn until all loops have disappeared; the ends of the catgut are knotted and cut close. While pulling the catgut it will be seen that the serosa is inverted. I have been told that the catgut sometimes breaks; to avoid this it is wise to try its strength before using it, and while pulling it, to take hold of the catgut near the intestine; in case it breaks, not much harm can be done; it is advisable to tie a strand of catgut around the suture line.

The anastomosis is completed; there is no need, and it would be dangerous to use any reinforcing or protecting stitches whatsoever.

By examining figures 6 and 7, the value and simplicity of this method will easily be understood. It is seen that as the intestine is mounted on the rubber tube and sustained by it, it is easy to pass the continuous mattress stitch. By keeping the stitch taut and tucking in the serosa a considerable inversion is already obtained.

When the mattress suture is finished and the silk tied, it will be seen that by obliterating the catgut loops, the silk will be brought down, carrying with it the serous surfaces and burying everything that came in contact with the intestinal cavity, under so large a surface of serosa that the union between the surfaces in contact will be so close as to make leakage and infection impossible.

The same phenomena take place all along the suture line and the terrible and dangerous mesenteric angles, dead spaces, are automatically as completely secured as any other portion of the gut.

Everything is buried—catgut, silk, knot, tube—under a large portion of serous surfaces. (Fig. 5.) Intestines of different caliber can be anastomosed with the same facility and rapidity as if the calibers were the same; it is obvious that the mattress stitch should take a larger bite on the larger segment, a tube one-third less than the smaller segment being used, and it is advisable to put in at least three temporary stitches.

I have never experienced, and I am under the firm impression, that it is impossible to cause a stenosis even by making the continuous mattress stitch irregular. I explain this fact in the following manner: The rubber tube, being elastic, is compressed by the inverted cut edges (See figure 7) and exercises a gentle and continuous pressure on the suture line, facilitating the formation of adhesion between the serous surfaces at their extremity of contact.

From the experience gained in long experimental work and the results obtained on human beings by the above named surgeons and myself, I feel that I can conscientiously draw the following conclusions. This is the easiest, most rapid, and safest method of intestinal anastomosis. Experimentally I have made as many as six anastomoses in dogs at

one sitting in about 40 cm. of ileum, and in Budapest before the Surgical Session of the International Medical Congress, I killed one of these dogs. No adhesions were found, and only one anastomosis was traceable, and to show that really there were six of them, I cut off the gut, and by holding it up against the light a tiny line of scar tissue alone demonstrated that the six anastomoses had been made. *There were no adhesions, and no strictures.* I do not think that with any surgical skill and using any other method such happy results could have been obtained. The absence of adhesions and strictures proved by the autopsy of all the dogs operated upon had the most brilliant confirmation on human beings.

In the first case operated upon by Dr. Sullivan, as reported below, on opening the abdomen one month after the anastomosis had been made, for another operative purpose, the anastomosis could hardly be found. I quote the words of Dr. Sullivan: "The anastomosis was very difficult to discover and in every way resembled those which we secured in the laboratory on normal intestine."

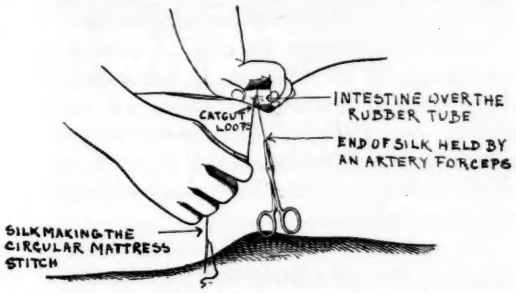
INTESTINE OVER THE RUBBER TUBE
CATGUT LOOPS
END OF SILK HELD BY AN ARTERY FORCEPS
SILK MAKING THE CIRCULAR MATTRESS STITCH

Fig. 4.—Correct way of pulling the silk of the circular mattress suture.

I want to emphasize this result because even in a case which had been operated upon on account of old adhesions, and after so many operations, the new anastomosis could hardly be discovered. Anastomosis between guts of different caliber is as easy, rapid, and safe as any other anastomosis. As previously stated, the rapidity of the procedure is most remarkable; in dogs very often it took me only four minutes to perform a complete anastomosis, and it took exactly that time when, by request, I made an anastomosis before the Surgical Session of the International Medical Congress in Budapest. In a case described below the patient's life has really been saved by the rapidity of the operation, which took about four minutes, and by the very small amount of shock produced. It is the easiest method because only one row of sutures is necessary and suturing is made easy by the fact that the intestine is supported by the rubber tube; the dead spaces of the mesenteric angles are automatically closed without any difficulty and in a way that the best surgical skill cannot equal.

The technic used in my experimental work was found in every respect suitable to human beings; only one point had to be modified; that is the length of the rubber tube. In dogs we used tubes of about 3 cm. The tubes were all expelled in from 60 to 90 hours, and a very interesting point was that the above stated time was not sufficient to digest the catgut, so that the tube was expelled with silk, catgut and intestinal slough all together. When I operated the first time on a human being I was surprised not to see the tube after the fifth or sixth day, and my surprise was even greater when the tube passed only on the twelfth day. Of course I was not satisfied with such a result. The fault lay in the difference between the gut of human beings and of dogs. In dogs the muscularis is enormously strong and we were working on normal intestine, while in human beings we had to deal with gut the muscularis of which is not very strong and which was even weaker on account of pathological conditions; furthermore adhesions, as in the case which will be reported later, could hinder the passage of long tubes.

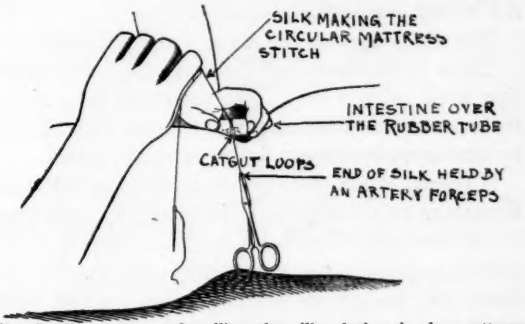
SILK MAKING THE CIRCULAR MATTRESS STITCH
INTESTINE OVER THE RUBBER TUBE
CATGUT LOOPS
END OF SILK HELD BY AN ARTERY FORCEPS

Fig. 5.—Wrong way of pulling the silk of the circular mattress suture.

The inconvenience has been very easily overcome. By using a rubber tube of the length of the diameter of the tube itself I had a body which would roll on itself and therefore could not stop anywhere and so would be passed easily. In the next case I used, indeed, a tube of the length of its diameter, and I had the satisfaction of seeing it passed on the sixth day, when I administered a purge. Since then I always used the tube of the length described and all of them passed with the purge, that is, from the sixth to the eighth day.

Another important point which I want to emphasize is that while making the circular mattress suture the silk must not be pulled perpendicularly to the intestine but parallel to it, in which direction it is impossible to tear even the most friable intestine, and thus there will be no necessity of putting reinforcing stitches. The latter are extremely dangerous, because the tube being elastic makes an even

pressure all around the circular suture; when reinforcing stitches are put in, the tension is greater over these stitches, thus causing the suture to cut through. After a little practice it is easier to pull the silk parallel to the intestine (or even lower, as shown in figure 4) than perpendicular to it, so I think that no operator will find any trouble in this.

I cannot urge strongly enough to try the method on the cadaver or on dogs before using it on human beings; the technic is extremely easy, but like everything new it must be mastered. I recommend the use of silk or linen, not too fine, because it is liable to cut through the gut. Nos. 10 to 15 are the best in my opinion. In preparing the tube it is better to use a round needle which does not cut the rubber.

Plain catgut No. 3 has generally been used, but in case of an emergency any suture material may be substituted. Catgut has been preferred because the loops stand out prominently between the cut edges even when wet and they slide without cutting the rubber.

The advantages of the method are apparent:—

There is absolutely no stenosis along the suture line, even using a very small tube, and time seems to improve the anastomosis, as it has been shown by numerous specimens dating several months.

It precludes the necessity of making lateral anastomosis in many cases and of one's being compelled to use mechanical devices when the condition of the patient requires a quick operation; the anastomosis made by mechanical devices being neither more rapid nor as safe, and they are not always at hand.

Gas and feces pass freely through the tube, the diameter of which is almost equal to that of the intestine.

No foreign body, not even silk, is in the abdomen a few hours after the operation. The elasticity of the rubber tube prevents kinking of the intestine along the suture line, and it helps the peristalsis.

But the main advantages are:

Great rapidity, safety, little trauma and therefore no formation of adhesions; the caliber of the intestine to be anastomosed is of no importance: The blood supply of the line of anastomosis is ideal, far better than in the lateral method. In fact, the union of the serous surfaces takes place at the outer part without the interference of any stitch, which always strangulates the bloodvessels, in this way leaving the blood supply where the anastomosis takes place in absolutely normal condition. The various abdominal organs do not come in contact with any foreign bodies, as the silk or catgut used in the Lembert suture, but with the serosa very little inflamed because the line of union did not suffer any traumatism such as passing the needle, or handling for a long time with already infected hands, pads, and instruments. The adhesions between the two cut edges takes place by the little exudation derived from the contact of the two inverted serous surfaces, the reaction of which is very mild, so that there is no chance of having a large space of inflamed serosa, as it happens when the two cut edges of the intestine are crushed between metallic buttons.

The only objections that could be raised against the method is the introduction of a foreign body into the intestine. The objection seems very strong, but there is no ground to take it seriously. The intestine is made for the passage of foreign bodies, and if we introduce a foreign body which can be easily expelled, the objection is worthless. In fact, the experience on human beings taught me that when a tube is too long sometimes it has difficulty in passing, as shown in the case of Drs. Sullivan, Torek and myself. In these cases we all use tubes of about 3 cm., and it is easily seen that where there are angulations of the gut caused by adhesions the tube may have difficulty in passing through. But it is sufficient to shorten the tube, to make it of the same length of its diameter, so that it rolls like a compressible ball, and its expulsion will take place without any difficulty whatsoever, as has been proven in the other cases, in one of which, my case, at the sixth day the tube had passed, although there were many adhesions.

The anastomosis of the sigmoid deserves special remarks. *It is absolutely indispensable to pull the silk or linen of the circular mattress stitch as indicated in figure* 5. *Otherwise, the gut being generally exceedingly friable, will tear;* care must be taken to invert well the serosa, the intestinal wall being often very thick; the epiploic fat near the cut edges should be tied with catgut and cut close to the knot.

Often I had trouble in finding the tube when examining the feces; it is advisable to dilute the feces with water, otherwise the tube filled with fecal matter will not be noticed. In many cases while working on dogs I have been unable to trace the tubes, but at the autopsy I never found any in the intestine, which indicates that if the feces are not washed with much water the tubes can be overlooked.

I will here report in a group the first cases operated upon in which the faulty technic gave some trouble, and in one it caused the loss of the patient. It will be seen that by following carefully the technic described above all the inconveniences would have been avoided, as they have been in the ten other cases in which there were no inconveniences, and the results were highly satisfactory, the patients not having even the slightest degree of fever.

Keenan and Sullivan. CASE I.—Miss "H. E." was operated on four years ago in Iowa for appendicitis, following which she had a servere attack of peritonitis. Two years ago she was brought from Iowa to Dr. Keenan, in extremis, suffering from acute intestinal obstruction. He operated upon her, was forced to resect the gut and anastomosed it with a Murphy button, in order to get the patient off the table in minimum time. He found that there were adhesions everywhere, the bowels being adherent to the parietal and visceral peritoneum on all sides. The patient promptly recovered, but never passed the button, and refused to have it removed. She carried it until about a year ago, when a slowly increasing ileus forced her to come to the hospital. In the oral end of the side-to-side anastomosis previously made was found the Murphy button. The end of the gut was dilated and thickened, and the opening between the two limbs would scarcely admit a lead pencil, consequently, the entire anastomosis was excised and an end-to-end resection was done by the method we used in the laboratory last year. The patient was promptly relieved, and began to gain in weight, but did not pass the tube. One month later, we again operated upon her to remove a very large ovarian cyst which we did not feel it would be wise to touch at the previous operation, and found that the tube had passed on about 10 inches, and then had lodged in an angulation caused by her old peritonitis. We removed the tube through a small incision in the gut. *The anastomosis was very hard to discover, and in every way resembled those which we secured in the laboratory on normal intestine.*

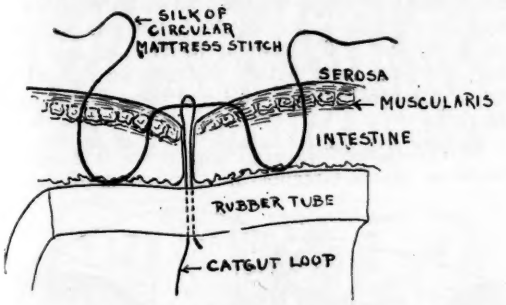

Fig. 6.—Before tying the circular mattress stitch and obliterating the loops.

In this case for the first time the method had been employed on a human being by Dr. Keenan and Dr. Sullivan. A tube of about 3 cm. had been used. The tube stopped at an angulation of the intestine on account of its length; this could have been avoided if the tube had been of the same length as its diameter, *i. e.*, about 1 cm.

Soresi. CASE II.—Gaetano S., 36 years, had right inguinal hernia for six years, which became strangulated while the patient, under the influence of liquor, tried to lift a table. Patient seen 28 hours after accident. On operation gangrenous patches of the small intestine made necessary the resection of about 40 cm. Anastomosis with Soresi's method, which required about six minutes. Recovery uneventful. Tube passed on the twelfth day after operation; patient had slight diarrhea from the eighth to the twelfth day after operation.

Here, as in the case reported above, a tube of about 4 cm. had been used, and very likely the diarrhea was caused by the tube having stopped somewhere. As in the other case a much shorter tube would have avoided the little inconvenience.

Tuttle. CASE III.—L. H. F., 55 years, operated upon for carcinoma of sigmoid. Resection of about 8 cm. of intestine, and anastomosis with Soresi's method. In this case I assisted Dr. Tuttle. The intestine was very brittle, and while making the circular mattress suture, by not pulling the silk parallel to the intestine, the serosa was torn in two places. We thought that it was safer to put in two reinforcing stitches. The patient developed symptoms of peritonitis, and on the third day the abdomen was reopened. There was leakage only where the reinforcing stitches had been put. An artificial anus was made, but the patient died three days later.

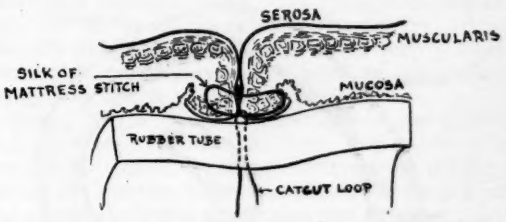

Fig. 7.—After tying the mattress stitch and obliterating the loops. Schematic demonstration of how the serous surfaces are inverted and how the silk of the mattress stitch is buried even over the knot.

This case has taught me and should teach everyone using the method a good lesson, viz, to pull the silk parallel to the intestine, thus avoiding tearing of the serosa. In case there are very small tears they are of no importance, but if large, make another anastomosis, and if the intestine is too brittle to stand stitching, or the cut edges cannot be well approximated without tension, make an artificial anus.

Torek. CASE V.—Resection of sigmoid for carcinoma. Sarah B., 40 years, married. Patient had been suffering from intestinal obstruction for four weeks, during which time cathartics had been futile and enemata had brought out only colored fluid and occasionally a tiny bit of fecal matter. Vomiting had begun in the latter part of the second week of her obstruction, and even then was not constant. The diagnosis of carcinoma of the intestine was made. Exploratory incision in the median line on January 13, 1910, revealed an enormously distended sigmoid flexure bent twice upon itself, dividing it into three sections, the first one being directed down, the second up, and the third down again. The sigmoid almost completely filled the abdominal cavity, the rest of the colon being but slightly distended and the small intestine being even extraordinarily small in caliber. At the lowermost end of

the sigmoid was a carcinoma. It appeared that the sigmoid above the carcinoma would not be able to stand any sort of operation, so a colostomy was done at the cecum, through a separate incision in the right iliac fossa, the median incision being closed. A stomach tube was introduced through the cecostomy wound down the colon to the sigmoid and this was washed out several times daily, bringing out very large quantities of feces.

Nine days later, January 24, the carcinoma was resected through a left inguinal incision and an end-to-end union, according to Soresi's method, made. The operation was very difficult. In the first place the deep seat of the tumor made it hard to get at. Then the sigmoid had not recovered sufficiently to stand stitching well; the silk sutures tore through the brittle tissues several times; the catgut loops in the Soresi tube were hard to find, as a tube of the ordinary thickness for the small intestine had been selected, so that the caliber of tube and intestine were very much out of proportion. Owing to the thickness of the walls of the intestine quite some strength had to be employed to invert the cut edges, with the result that at one time the silk suture tore, so that it became necessary to begin suturing from the other end and knot the silk where it had torn. Finally, as the catgut was pulled to straighten out the loops, it also tore, so that it could not be knotted. The anastomosis appeared to be so unsafe that the abdominal wound was not closed, but a tampon inserted through its thickness. Nothing happened until the eighteenth day after the operation, when feces appeared in the left iliac wound. To-day, February 22, the twenty-ninth day after the operation, I felt the tube at the bottom of the wound and drew it out. The catgut, the silk, and a portion of necrotic tissue were attached to it. The patient's general condition is excellent.

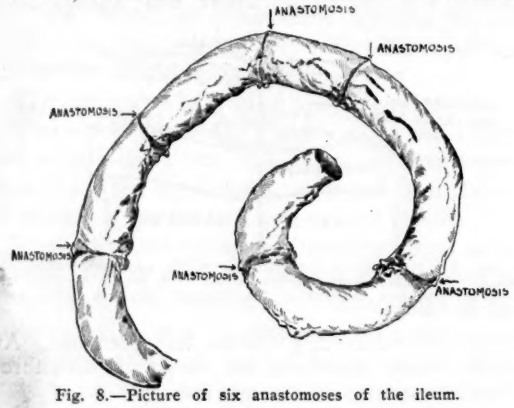

Fig. 8.—Picture of six anastomoses of the ileum.

Here are Dr. Torek's commentaries on the operation: "I believe the method will do very well for the small intestine, where, after extensive resections, one can bring fairly normal edges together end to end. In resections of the large intestine this will often be impossible. If the method is employed in resection of the large intestine, I believe that a much larger tube should be used than for the small intestine, as also thicker silk and thicker catgut."

As Dr. Torek himself says, the tube was out of proportion, the silk was too fine, the catgut not strong enough, and the catgut loops were so long, about 10 mm. instead of 2, that they were twisted under the cut edges, and difficult to obliterate.

In contrast with the two preceding cases, I report the two other cases of anastomosis of the sigmoid, where the results were highly satisfactory on account of the perfected technic.

Torek. CASE V.—On June 5, Dr. Torek asked me to go to the New York Post-Graduate Hospital because he had a patient with a tumor of the sigmoid which would require resection, and would like to have me show my method to the surgical class. I explained the method, preparing the tube while Dr. Torek was dissecting the tumor. I assisted Dr. Torek in making the anastomosis; the procedure took about eight minutes, and although the gut was very friable and thick the union was perfect in every respect. The patient never had any fever, and claims to have passed the tube on the seventh day, although the tube had not been found in the feces.

Soresi. CASE VI.—T. P., 44 years, was referred to me by Dr. G. Greenberg. Carcinoma of sigmoid, necessitating resection of about 6 cm. of gut, anastomosis with Soresi's method, which took about seven minutes. Here an interesting accident happened. While pulling the catgut loops, the catgut broke. One strand of catgut was passed around the suture line and the result was very satisfactory. Recovery uneventful. Tube passed on the sixth day.

Fig. 9.—Anastomosis between ileum and colon.

Torek. CASE VII.—Resection of small intestine for strangulated umbilical hernia. Ethel B., 40 years, married. Umbilical hernia of three years' standing. She was admitted to the German Hospital on December 25, in the afternoon, and was operated upon a few hours later, about thirty-two hours after the beginning of her strangulation. The hernia was very tense, the skin bluish red, and the suffering intense. An extensive gangrene of the small intestine was found, so that five feet of the intestine had to be resected. An end-to-end anastomosis by Soresi's method was made, after which the abdominal wall was closed according to Mayo's method. With the exception of some vomiting on the first and second days after the operation, the recovery was uninterrupted. There was no rise of temperature. A soapsuds enema given on the fifth day was effectual. Tube passed on the tenth day.

Keenan-Sullivan. CASE VIII.—Mrs. F. N. was brought to us shortly after midnight on March 20 with a strangulated left femoral hernia. The hernia

was reduced, but we were forced to resect about five inches of the ileum. We put in the rubber tube after Soresi's method. The patient made an eventful recovery, and passed the tube March 27, at 4 p. m. In this case the result was highly satisfactory.

Keenan-Sullivan. CASE IX.—E. J. Strangulated inguinal hernia. Resection of about eight inches of small intestine; anastomosis with Soresi's method; recovery uneventful. Tube passed eight days after operation.

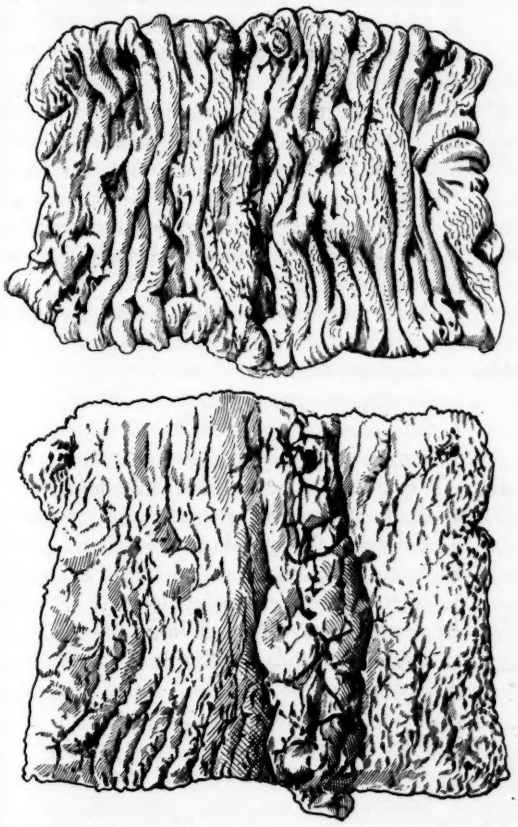

Fig. 10.—Comparison with the open method (Jejunum method) (lower picture) and the Soresi method (upper picture).

Summers. CASE X.—R. C. S., 8 years of age. Strangulated umbilical hernia. Resection of about 10 inches of ileum; anastomosis with Soresi's method, which took about nine minutes; abdominal wall closed by Blake method. Recovery uneventful. Tube passed on the seventh day.

Summers. CASE XI.—H. Y. T., 38 years of age. Strangulated inguinal hernia. Resection of about two feet of ileum; anastomosis with Soresi's method, which required only about seven minutes. Uneventful recovery. Tube passed on the eighth day.

Soresi. CASE XII.—Mrs. J. S., 28 years. Two pregnancies, one abortion. Had been operated upon two years previously for tuberculous peritonitis. She became constipated and suffered terrible pains in the abdomen. A mass was felt on the right side. On opening the abdominal cavity many adhesions were found between the different abdominal organs. In the right side the mass was found to be small intestine adhering to the ascending colon. The adhesions between colon and ileum were broken up, but it was impossible to unravel the mass, so it was resected, and an anastomosis made. The operation was extremely difficult on account of large adhesions. A tube about 1 cm. in length was used, and three temporary stitches were inserted to hold it in place. Recovery uneventful, save slight rise of temperature the first four days. Tube passed on the eighth day.

Soresi. CASE XIII.—S. T., 28 years of age, healthy and strong. During a quarrel received a stab wound in the abdomen which he did not notice until a few moments had passed. When seen the patient was very pale; his pulse was about 200; there was a wound to the left of the umbilicus about 3 cm. in width. Laparatomy was performed immediately. A great quantity of blood was found in the abdominal cavity; no fecal matter. After a short time there was found a cut through the mesentery of the small intestine, severing the artery. Fearing gangrene from loss of blood supply, about 6 cm. of intestine were resected and an anastomosis made, which took about four minutes.

Owing to the very low condition of the patient, only one row of suture had been used to close the abdominal wound. Saline intravenous injection had to be resorted to on account of the very great loss of blood. Pulse after operation over 200; next morning, 180. The recovery was very prompt. Tube passed on the seventh day.

I think that the patient's life was saved by the remarkable rapidity of the operation, which was done under the most unfavorable circumstances: at 2 o'clock in the morning, in a room illuminated only by gas, and with the poorest assistance, and among people nervous for fear of police intervention in case of death.

Herewith are reproduced the pictures of some of my experimental works on dogs.

In figure 6 anastomosis had been made in about 40 cm. of ileum; note that no stricture resulted and no adhesions—dog killed before the Surgical Section of the International Medical Congress in Budapest.

Figure 9 shows the result of anastomosis between colon and ileum.

Figure 10.—Comparison with the open method now in use and the method described; dog killed after five days.

In conclusion, I want to advise against using the method in emergency cases without having thoroughly mastered it. I think that in emergency cases it will render the greatest services, because one can perform the operation all alone. For that reason it will be very useful to military surgeons and to the surgeon doing emergency work, but he must be thoroughly familiar with the method in order to make a quick and safe anastomosis.

I shall be very thankful to surgeons who will send me reports of cases operated upon by the method here described, and I shall gladly furnish them any further information bearing on it.

20 WEST 47TH STREET.

THE NOMENCLATURE OF THE DISEASES OF THE VERMIFORM APPENDIX.

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The universal and extensive study of appendicitis in recent years has brought about an approximate, if not an absolute, unanimity concerning its clinical and therapeutic considerations. The classification of the diseases of the appendix, on the other hand, may still be truthfully termed chaotic, as anybody will promptly recognize who has had occasion to examine, even superficially, the voluminous literature of this subject. It is because of this lack of uniformity of classification that it has been exceedingly difficult in many instances to form a definite clinical or pathological conception of the form of the disease to which an author refers. For instance, in a recent excellent paper, I notice the classification "acute suppurative appendicitis." This may denote either a phlegmonous inflammation of the appendix, or an abscess in the wall, or an empyema of the appendix, or an appendicitis with an extra appendicular abscess. And to increase the ambiguity, the author adds the classification "acute suppurative appendicitis with abscess."

Confusion of classification is especially notable in respect to that much abused term "peritonitis." A lesion which one author calls a peritonitis, another will not. The confusion is furthermore aggravated by the manner in which the terms "localized," "diffuse," "general," "spreading," "progressive," "fulminating," "florid," "septic," and "peritoneal sepsis" are promiscuously employed. I believe this is the one important reason, why the mortality statistics of different operators vary so widely. One surgeon reports perhaps ten per cent. mortality in a certain form of peritonitis, while another, with practically the same method of treatment, reports a mortality of fifty per cent.

A rational classification of the diseases of the vermiform appendix should have, to my mind, the following attributes: (a) it shall be simple, (b) it shall be complete, and (c) the subheadings shall be sufficiently distinctive, so that the name shall convey a distinct pathological picture of the disease.

For these reasons I venture to suggest as a working basis the following classification, which I have elaborated after a study of nearly 4,000 cases of appendicitis, observed in Mount Sinai Hospital in the course of eleven years. While the classification is mainly a pathological one, I believe it possesses the added merit that in a broad way it accords with the clinical and prognostic aspects of the disease.

I. Catarrhal inflammations.
   a. Acute catarrhal appendicitis..
   b. Chronic catarrhal appendicitis.
   c. Acute catarrhal appendicitis with abscess.
   d. Appendicular abscess.

II. Destructive inflammations.
   a. Acute gangrenous appendicitis.
   b. Acute gangrenous appendicitis with abscess.
   c. Acute gangrenous perforative appendicitis.
   d. Acute gangrenous perforative appendicitis with abscess.
   e. Acute gangrenous or perforative appendicitis with gangrene of cecum.

III. Retention cysts.
   a. Hydrops of appendix.
   b. Empyema of appendix.
   c. Empyema of gangrenous appendix.

IV. In combination with blood infections.
   a. Acute gangrenous or perforative appendicitis with thrombosis of mesentery.
   b. Acute gangrenous or perforative appendicitis with portal pylephlebitis.

V. In combination with peritonitis.
   a. Dry or fibrinous peritonitis.
   b. Serous peritonitis.
   c. Seropurulent peritonitis.
   d. Purulent peritonitis.
   e. Appendicular abscess with purulent peritonitis.

VI. Specific inflammations.
   a. Tuberculosis.
   b. Actinomycosis, etc.

VII. New growths.
   a. Carcinoma.
   b. Carcoma.
   c. Fibroma.
   d. Diverticula, etc.

I shall not describe the essential pathological features of each form (many are self-evident), but shall indicate only in the debatable forms the reasons why that particular division appears to be justified.

I.—CATARRHAL INFLAMMATIONS.

a.—Acute Catarrhal Appendicitis.

The right iliac fossa is free from adhesions, un-

less there have been previous attacks of inflammation; a few recent, easily separable adhesions may be present. The peritoneal surface of the appendix may be covered with lymph, or may merely be congested. The organ in a large proportion of the cases is in an erectile state. On section all the coats are thickened; the mucosa shows varying degrees of congestion; the lymph follicles are swollen; the lumen in a majority of the cases is empty, or it contains a small quantity of mucus, or a mucopurulent exudate, or a coprolith.

b.—Chronic Catarrhal Appendicitis.

The appendix is generally flaccid; the serosa is more or less injected; in more than half of the cases adhesions are found which bind the organ to the neighboring peritoneum. The coats of the appendix show thickening; the musoca may or may not be congested, and may show one or more areas of erosion or ulceration; the solitary follicles are enlarged. The lumen contains a small amount of mucus, or muco-purulent material, or feces, and not infrequently coproliths. Strictures of the lumen are quite common; less frequently kinking of the appendix is met with, due to adhesions or to shrinking of the mesenteriolum.

c.—Acute Catarrhal Appendicitis with Abscess.

This group is interesting from a pathological standpoint, because it shows that extra appendicular abscesses may arise without any visible loss of continuity in the mucosa of the appendix. Pathologically the appendix shows no changes beyond those described for the acute catarrhal cases; the presence of an abscess, however, is obviously of sufficient importance to necessitate a separate group.

d.—Appendicular Abscess.

The term "appendicular abscess" is merely a makeshift, and means that for various reasons it was not possible to extirpate the appendix, so that its pathological condition was not ascertainable. Usually these patients are too seriously ill to permit a lengthy search for the appendix, and on that account it would perhaps be preferable to group these with the destructive inflammations.

II.—DESTRUCTIVE INFLAMMATIONS.

a.—Acute Gangrenous Appendicitis.

The term "gangrene" represents a lesion so characteristic that it is hardly necessary to define it. Whether the gangrene is of limited extent or involves the entire appendix is a point that may be disregarded.

b.—Acute Gangrenous Appendicitis with Abscess.

The only difference pathologically between this group and the one just described lies in the presence of a well localized abscess. Practically the abscess complication is important, because it necessitates drainage, a resort that is not, as a rule, necessary in the preceding subdivision.

c.—Acute Gangrenous Perforative Appendicitis.

This group of cases in the uncomplicated form, is infrequently met with, for the reason that when perforation occurs an abscess is usually associated. The perforation adds slightly to the prognostic importance of this group.

d.—Acute Gangrenous Perforative Appendicitis with Abscess.

This term also requires but very little definition.

While the four preceding groups are not, as a rule, diagnosticable, one from the other (except when a palpable abscess is present) and demand the same method of treatment, it appears to me that they require separate classification, for the reason that each form affects the prognosis appreciably.

e.—Acute Gangrenous or Perforative Appendicitis with Gangrene of Cecum.

A very rare complication (only six in nearly 4,000 cases), but nevertheless very important. In this, as well as most of the subsequent groups, we have disregarded the condition of the appendix, i. e., whether gangrenous or perforated, etc., because the latter complication plays a minor rôle in the general picture of the disease. This particular complication is a very formidable one, as is shown by the high mortality. The extent of the gangrene varies within wide limits; in some cases only a few centimeters around the base of the appendix were involved, in others (two of our six cases) the entire cecum and part of the ascending colon were involved.

III.—RETENTION CYSTS.

a.—Hydrops of the Appendix.

Usually cases of low degree of virulence. They differ from the succeeding group only by the fact that the contents are mucoid and not frankly purulent in character.

b.—Empyema of the Appendix.

By this term we refer to a distinct group of cases, usually of the chronic variety, in which a considerable collection of pus is found within the lumen of the appendix. This can involve the organ in its entire extent, or only a portion of it. The lumen of the appendix is necessarily shut off at its cecal attachment, either by an atresia of its walls or by a coprolith. The mucosa lacks manifest ulcerations or necrotic areas.

c.—Empyema of Gangrenous Appendix.

In contradistinction to the preceding group, this group shows more or less extensive gangrene of one or more of the coats of the appendix. This classification is necessary, because we have found

that clinically and prognostically these cases are of greater severity than the preceding.

IV.—COMBINATIONS WITH BLOOD INFECTIONS.

a.—Acute Gangrenous or Perforative Appendicitis with Thrombosis of the Mesentery.

Under this heading we do not refer to the thrombosis of the appendicular mesenteriolum, so frequently seen, but to a thrombosis which has extended into the mesentery of the small intestine. This complication is a very serious one, and for the following reasons: (1) The involved intestine may become necrotic, or at least paretic, so that it loses its function. (2) The thrombosis may extend to larger branches of the portal system. (3) A thrombosis may be dislodged and form emboli in remote parts. (4) There is a greater susceptibility to general sepsis, and (5) Peritonitis may supervene more easily.

b.—Acute Gangrenous or Perforative Appendicitis with Portal Pylephlebitis.

This group is a more advanced stage of the preceding. From both a clinical and a prognostic point of view this group obviously requires separate classification.

V.—COMBINATIONS WITH PERITONITIS.

Acute Gangrenous or Perforative Appendicitis with

a.—Dry or Fibrinous Peritonitis.

b.—Serous Peritonitis.

c.—Seropurulent Peritonitis.

d.—Purulent Peritonitis.

e.—Abscess and Purulent Peritonitis.

The commonly employed term "general" peritonitis is clinically not justified, because it is impossible to determine, through a short operative incision, whether the entire peritoneal cavity is involved or not. The term "general" is, therefore, only justified in cases that have been proven to be such at autopsy. The same argument holds for the terms "spreading," "florid," etc. In Mount Sinai Hospital we have adopted the term "diffuse," because we believe it presents the actual conditions as we find them at operation better than any other term. By the term "diffuse" we refer to inflammatory changes in the peritoneal cavity, whose extent cannot be defined within the limits of our incision. The peritonitis so commonly met with that is localized to the immediate neighborhood of the appendicular region in acute cases, is not included in our classification, because, in our experience, we have found it of no clinical, therapeutic or prognostic importance. For the same reasons, we have excluded the condition of the appendix itself.

It may be said that a differentiation based upon length of incision will vary according to the personal taste of the operator and will therefore not be sufficiently definite. For obvious reasons, however, a more exact operative differentiation is not possible, unless of course, the surgeon makes such large incisions as will enable him to visibly explore the entire peritoneal cavity. I believe there are few surgeons, in these days, who are in the habit of employing such incisions.

Our classification of peritonitis is based largely upon the character of the exudate. We therefore recognize a serous, sero-purulent, purulent, and dry peritonitis. The lesions found in peritonitis are too familiar to require a detailed description. Clinically we have but very meager data upon which to differentiate one from the other; prognostically, however, the differentiation is of much importance; therapeutically, again, less so. It has been said by some, that these various forms are merely stages of one and the same process. That this is not entirely so, is shown, first, in the practically same duration of the illness of all three forms (as a study of a large number of cases has proven to us), and secondly, in the occasional exceptional virulence of a serous or a dry peritonitis. It is more probable that the character of the exudate depends largely on the virulence of the infective organisms, and upon the susceptibility of the patient.

The separate classification of appendicular abscess with diffuse peritonitis is one of necessity. These cases comprise such, in which for valid reasons, the appendix could not be removed at the primary operation.

VI.—SPECIFIC INFLAMMATIONS.

a.—Tuberculosis of the Appendix.

b.—Actinomycosis of the Appendix, etc.

VII. NEW GROWTHS OF THE APPENDIX.

a.—Carcinoma.

b.—Sarcoma.

c.—Fibroma.

d.—Diverticula, etc.

The names of these final groups are self-explanatory.

In conclusion I need only repeat that this classification comprises only the broad pathological groups that are of clinical, prognostic or therapeutic importance. Were some of the lesser complications included, this classification could be almost endlessly amplified. I do not claim that the classification is perfect, and I offer it merely because we have found it of excellent service as a working basis for our statistical reports. Whatever the merits of this classification may be, I believe the time is opportune that the representative Surgical Societies of the country should agree upon some definite classification of appendicitis, so that subsequent reports may have a common basis for comparison.

BIER'S HYPEREMIA IN GENERAL PRACTICE.*

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No advance in therapy made in recent years, compares in importance with the methods of cure given us by August Bier, now professor of surgery in the University of Berlin. By observation, research, and experiment he came to realize the importance of hyperemia in Nature's combat with disease. The practical methods he has taught us of producing or increasing artificially this weapon of Nature, hyperemia, are, or ought to be, of interest to every practitioner, for by their use his ability to cure is increased, and to cure is the main work of a doctor's life. In this paper the subject of Bier's hyperemia can but be touched upon, the aim being to briefly describe for the practitioner its practical working.

By Bier's method, hyperemia is produced in three ways,—by constriction, by suction, and by hot air. As the curative effects in all these forms of what may be termed clinical hyperemia (*i. e.* hyperemia intentionally produced for curative purposes), come through the blood, it may be well to consider briefly the properties of the blood that are thus made use of. These are five, analgesic, bactericidal, absorbent, solvent, and nutritive. These properties come into marked prominence through the action of hyperemia and will be here described as the effects of hyperemia.

(*a*) *Analgesic effects.* The analgesic effects of hyperemia are universally known. The very common practice of applying a hot poultice, or a hot water bottle for the relief of pain is based on this general experience. Less common is the knowledge that air heated to the temperature of boiling water (212° F.), and even hotter, can be well borne by the skin, and is very effectual in the relief of pain in certain conditions. Thus the joint pains of chronic rheumatism, the pains of sciatica, lumbago, and trifacial neuralgia are greatly relieved by the agency of hot air, applied by means of suitable apparatus. Less common still is the knowledge that constriction hyperemia, produced by means of a properly applied rubber bandage, is of great analgesic power in acute gonorrheal joint cases.

(*b*) *Bactericidal effects.* We know that blood serum has decided bactericidal effects, and also that the white blood corpuscles play an important part in the destruction of bacteria, a discovery we owe to the observation and study of Metschnikoff. In consideration of this knowledge, we are not surprised to learn of the powerful bactericidal action of constriction hyperemia demonstrated scientifically by Notzel in 1899. He innoculated sixty-seven rabbits in parts of their bodies subjected to constriction hyperemia, with anthrax and virulent streptococci. Fifty-one of the rabbits survived. In the sixteen that died, true constriction hyperemia was not produced. That it was constriction hyperemia alone that saved the fifty-one surviving rabbits was demonstrated by injecting them a few weeks later unprotected by constriction hyperemia, with similar bacilli and streptococci as at first. All of them perished with the control animals.

(*c*) *Absorbent effects.* Modern physiology teaches that watery substance, and bodies that are soluble in water, are absorbed through the blood capillaries and not, as was formerly supposed, through the lymphatics. An experiment demonstrating this view was performed by Klapp, Bier's assistant. He ligated the thoracic duct and the right lymphatic duct in dogs, and thus excluded all lymph channels through which could be carried sugar of milk, which he injected into the abdominal cavities. None the less, all the sugar of milk appeared in the urine within the time observed in the same animals a few days previously when their lymph channels were normal. This experiment proves unassailably that a substance soluble in water can be taken up, absorbed, and that by the blood circulation without other aid. Previous to this experiment, Bier had discovered, when treating chronically diseased joints alternately by active (hot air) hyperemia and constriction, that hot air hyperemia caused a quick disappearance of the edema that sometimes occurred after constriction hyperemia. This result led him to use hot air hyperemia in the treatment of elephantiasis, and in the edema that is present after healed fractures of the extremities, with the expectation of causing the absorption of the edematous fluid present. Nor was he disappointed. Hot air hyperemia proved a most effective absorbent agent. In acute traumatic synovitis with effusion, the writer's experience as well as that of others, has frequently found it quickly curative.

(*d*) *Solvent effects.* That the blood has solvent powers is shown by the disappearance, for example, of a catgut ligature in the body. Softening of scar tissue has been observed in the physiological hyperemia accompanying pregnancy, scar tissue in the vagina becoming softened and allowing birth to take

* Read before the Norfolk South District Medical Society Hospital, March 4, 1909.

place without difficulty. Landois has demonstrated that the blood serum of every animal dissolves the blood corpuscles from a different species. Bier observed the disappearance of arthritic granulations and joint blood clots and nodules on tendons, under the influence of hyperemia, produced by the various methods of constriction, hot air, and suction.

(*e*) *Nutrient effects.* Constriction hyperemia causes increased growth of hair. This has been observed by Bier and Helferich. Arterial hyperemia has the same effect, shown, maybe, by the hairy hands of the surgeon, which are in a state of active hyperemia because of the frequent washings to which they are subjected. John Hunter's experiment of transplanting the spur of a rooster into its hyperemic comb, causing the spur to grow enormously, furnishes an example of the nutritive effects of hyperemia. While epithelial coverings can thus be influenced by hyperemia, there is no proof that glandular epithelia can be hypertrophied by hyperemia. Indeed chronic congestion (hyperemia) of the liver produces atrophy of the liver cells (epithelial). There is no doubt of the positive influence of constriction hyperemia on bone growth. Helferich reported the case of a sixteen year old girl who had a chronic ulcer on one leg causing hyperemia of the leg which lengthened it 3 cm. By constriction hyperemia he succeeded in lengthening the healthy extremity 2 cm. In another case, that of a lad, ten years old, whose limb was shortened 3½ cm. subsequent to a fracture of the femur, a lengthening of the shortened limb to the extent of 1½ cm. consequent to its treatment by constriction hyperemia took place. Under the nutritive effects of hyperemia we may also consider regenerative effects. Bier treated ulcers, which had not healed by other remedies, with hot air hyperemia and cured them,—the hyperemia stimulating the regeneration of tissue; and following him the writer has obtained like results.

After this brief consideration of the blood forces concerned, a short description will be given of the three methods used of producing hyperemia and thus bringing these forces clinically into action.

Constriction Hyperemia; Technic, Indications, Case Reports.

Constriction hyperemia is produced in most cases by means of a rubber (or elastic webbing) bandage, wound several times around a limb and fastened with a pin. In the shoulder joint, constriction hyperemia is produced by a ring of rubber tubing around the shoulder, pulled toward the opposite side by webbing attached to the ring and traversing the body under the other shoulder. The amount of constriction depends on the tightness with which the webbing is drawn before fastening it. For the head the same result is attained, by winding a piece of elastic webbing around the root of the neck and pinning it.

Too much care cannot be given to mastering the correct production of constriction hyperemia. Bier and Meyer use the so called Esmarch bandage. This is safe in expert hands, because of familiarity in handling it; but, for the beginner, and especially for the patient to try to manage it, there is danger because of the strong degree of tension in the bandage. The writer, after investigation and experiment, has adopted a rubber webbing bandage, that allows, because of its moderate tension, easy regulation of the degree of constriction needful to produce the required hyperemia. After a considerable experience with this bandage himself, and observation of its use by his patients, several of whom could hardly speak English, the writer recommends it to his confrères with the conviction that it will make the way of the learner easier and safer.

To produce constriction hyperemia correctly, the rule is to tighten the constriction bandage sufficiently to cause redness of the part distally from the site of the bandage, yet not enough to cause pain or numbness.

Applied correctly, the venous outflow of the parts is obstructed by pressure on the veins while the pressure is insufficient to affect the arteries.

Constriction hyperemia has long awaited recognition and adoption as a curative agent. Farre and Travers in 1815, and Louis in 1835, called attention to the frequent association of pulmonary stenosis with lung tuberculosis, explaining the condition by the anemia of the lungs which this form of heart disease produces. Rokitansky, in 1838, taught that disease of the heart causing hypertrophy was never associated with tuberculosis, and also that lung tuberculosis was absent in persons with distorted spines, such distortion causing hyperemia of the lungs. Since then it has been recognized that an occasional association of such heart disease with lung tuberculosis is met with,—but the cases are very rare. These observations led Bier to consider the part played by passive hyperemia in the prevention and cure of tuberculosis,—for in hypertrophic heart cases and distorted spine cases there is present a pronounced venous congestion of the lungs. If Nature cured (or prevented the development of) lung tuberculosis by passive hyperemia, why should not passive hyperemia (in most cases easily produced by constriction) cure joint tuberculosis? This

very logical conclusion he tested in practice and with affirmative results. The tests he made led him into painstaking investigations upon hyperemia in general. The success of his experiments is but beginning to be realized.

Constriction hyperemia is used with curative effect in the treatment of joint tuberculosis, septic wounds of the head and the extremities, chronic arthritites of various etiology, acute gonorrheal joints, osteomyelitis, and other affections. As illustrating its use, the following cases are reported.

CASE I.—*Tuberculosis of the wrist joint.* Caroline B., aged eleven years. Noticed swelling of the left wrist and soreness on motion late in 1907; was treated at Carney Hospital for four months. On examination in April, 1908, there was swelling of the left wrist and tenderness in the carpal joints, and much limitation of wrist motions. Constriction hyperemia was produced by drawing a rubber webbing bandage twice around the arm just above the elbow and pinning it. Her mother readily learned how to properly adjust this bandage, and she was directed to apply it for an hour every morning. A blood tonic was extemporised and given her, and the anemia which was present on her first visit soon disappeared. A wood plastic splint was moulded over the forearm and wrist. The splint was applied only at night, to prevent trauma during sleep, further increasing the disease present. After three months there was considerable improvement, the swelling being less, the amount of the wrist motion increased, and the soreness much diminished. About this time a red spot was noticed over the distal end of the fourth metacarpal bone, and a week after some fluctation was detected. A small incision was made and a slight amount of pus was pressed out. A small suction glass was applied daily for an hour in the afternoon (that is, it was kept applied for three minutes, withdrawn for five minutes, then reapplied for three minutes, and so on alternately applying and withdrawing until an hour had been consumed). The opening put on a fungoid, tuberculous appearance, and finally a piece of bone (the head of the metacarpal it proved to be) was extruded. The suction hyperemia was maintained for another month when healing took place. During all the while, the constriction hyperemia for an hour daily was never omitted. The swelling, tenderness, limitation of motion, all the signs of disease disappeared after seven months treatment, and the girl was cured. Constriction hyperemia was continued for a month after as a precautionary measure.

CASE II:—*Palmar infection and abscess.* W. T., aged twenty-eight years, a bridgeworker. While helping to carry an iron beam, he slightly tore the palmar surface of his right hand, from a sudden attempt to hold more than his share of the burden. No antiseptic precautions were taken, and three days after pain and soreness caused him to seek surgical advice. At time of consultation his hand was moderately swollen and very tender, especially at the base of the middle finger, where there were a callous and the remains of a blister. The night before he had had a chill. There was an enlarged and tender gland in the right axilla. A small incision was made into the palmar tissue, where the infection had entered. No pus was met with. Constriction hyperemia was produced by means of a rubber webbing bandage. The patient was instructed to leave it off at night and to reapply it again in the morning. One nuclein tablet and one of echinacea were given every two hours, and 1-6 grain of pure calcium sulphide every hour was administered. On the second day of the treatment, the hand was considerably swollen, but the tenderness had not extended. On the third, the hand was very much swollen, and a thick, bloody pus was reached through the incision that had been made the first day of treatment. The treatment was continued and the patient was instructed to also place the hand in a solution of hot water and creolin (one teaspoonful of creolin to the pint of water), for ten minutes out of every waking hour, and to gently squeeze what pus he could out of the incised wound, and to visit the dispensary every morning and night for observation. The fourth morning there was considerable pus in the palmar sac, and pus was burrowing its way to the dorsum of the ring finger. Another incision, one-eighth inch wide, was made and the pus was carefully squeezed out. For two days there was considerable pus formation in the palmar sac. This was carefully squeezed through the two small openings which had been made. The treatment was continued, and on the eighth day there was a rapid decrease in the amount of pus discharged, and on the twelfth day the small openings through which the pus had been extruded were healed. Forced flexion of the hand for a few days, together with constriction hyperemia, which had been continued from the first day of treatment, caused all stiffness in motion to disappear, and recovery was complete.

Disappearance of an abscess under constriction hyperemia. Bier published the following case: "A boy of twelve years of age was admitted on the 23d of July, 1904, with a severe carbunclelike inflammation of the back of the head and neck. The skin over the occipital bone and down to the middle of the neck was densely infiltrated, and the neighboring parts were much swollen from odema, and were very tender. In the center of the hard swelling there was a soft portion about the size of a walnut. This was found by a diagnostic puncture to contain thick pus with staphylococci. The patient kept his head rigid and bent backwards; the temperature in the axilla was only 100° F. Constriction hyperemia was applied to the neck and maintained during the day time. By the 26th of July, the head was freely movable and the affected part was free from pain. The acute inflammation had become cold. A puncture now made in the soft part revealed only the clear serum. The constriction hyperemia was continued, and the patient was discharged on the

2nd of August; all traces of the inflammation, including the abscess, had disappeared."

In commenting on this case, Bier wishes it to be distinctly understood that he has allowed abscesses to be absorbed under constriction hyperemia only in a few cases where the symptoms were otherwise favorable. By so doing he has been able to demonstrate bacteriologically the powerful curative action of the treatment. His practice is to evacuate an abscess as soon as pus has been recognized. Bier believes that a process similar to the one mentioned before, occasionally takes place in cases of appendicitis and osteomyelitis.

SUCTION HYPEREMIA: TECHNIC; CASES.

Suction hyperemia is secured by lessening the air pressure on a portion of the body's surface. The method of dry cupping, at one time in vogue, produced its results by suction hyperemia. A great variety of apparatus by which almost every portion of the body can be subjected to suction hyperemia has been devised by Bier and his assistants. To describe them all would transcend the limits of this paper. The simpler pieces that are of interest to the general practitioner are the ordinary cupping glasses and the bell glasses for breast suction in case of mammary abscess. The cupping glasses are manufactured in three sizes, and are very useful for the hyperemia treatment of boils, small carbuncles, and tuberculous sinuses. In their treatment, the cupping glass of appropriate size, is applied over the boil or carbuncle, and caused to adhere to the skin lightly, by pressing the rubber bulb just previously to applying the glass. The partial vacuum thus created causes the glass to adhere to the skin. The suction should be maintained for five minutes, and then the glass should be removed for three minutes. The glass should be applied and removed alternately in this manner for about an hour. This period of treatment should be given daily. After the treatment the bulb and glass should be carefully cleaned. In many cases the patient can be taught to use the suction glass himself. The hyperemia produced can be seen through the glass; it is important not to produce too much suction which causes pain, and pain, when caused by any form of clinical hyperemia denotes that our technic is faulty.

Another piece of apparatus is the bell shaped glass for breast suction in cases of mammary abscess. This is made in three sizes, so that all breast cases can be treated. By means of a suction pump a slight vacuum is produced in the glass after it is applied over the breast. If an abscess has already formed a small incision should be made into it so that the pus can be sucked out. The suction should be applied for five minutes and then omitted for three minutes, and so on and off alternately until an hour be consumed with the treatment. With this treatment properly carried out, the suffering from puerperal mastitis is less and the end results better, there being less cicatricial tissue, less change of form and function, then follows the ordinary treatment.

The following two cases of tubercular sinuses treated by suction hyperemia illustrate its efficacy:

CASE III.—J. R., aged twenty-three, a printer; suffering from tuberculosis of the bones and joints of the right metatarsus. Part of the previous treatment at a dispensary, had been two weeks of hot air hyperemia, following which a deep abscess formed. This was incised, allowing the discharge of pus. An antiseptic dressing for four weeks followed, with no sign of healing of the sinus present. The condition on consultation was: The sinus was discharging through an ugly, bluish, undermined ulcer, about three-eighths of an inch in diameter. The foot was much swollen. On pressure there was much tenderness in all the metatarsal joints. An X-ray picture showed less density of all the bones compared with those of the normal foot, and complete obliteration of all the outlines of the metatarsal joints. The patient was instructed to apply a constriction bandage above the knee every morning for an hour. This was advised to be done in the morning as the edema in the foot was less at that time. He did this for two weeks; at the end of that time there was some improvement in the appearance of the ulcerous opening, the skin being somewhat less undermined. At this time suction hyperemia was produced in the sinus and this was continued daily for a period of five weeks when the sinus had completely healed.

The hot air treatment given in this case was contraindicated by Bier's teachings. In joint tuberculosis hot air treatment should not be used as it provokes abscess formation, as this case illustrates.

CASE IV.—C. B., aged twelve years, a schoolgirl. This case has already been referred to as a case of joint tuberculosis cured by Bier's method. The sinus, which followed the opening of a small tuberculous abscess, was treated by suction hyperemia, the suction apparatus being improvised by attaching the bulb of an atomizer to a Birmingham nasal douche. This was applied with moderate suction, for an hour daily, in the manner already described, by the girl herself. The sinus put on a fungoid appearance, and after about a week a piece of bone (it proved to be the head of one of the metacarpal bones), was extruded. The suction hyperemia was continued until healing became complete, about a month after.

HOT AIR HYPEREMIA; ITS PRODUCTION AND EFFECTS; CASES ILLUSTRATING ITS CLINICAL APPLICATIONS.

Hot air hyperemia is produced by exposing the surface of the part treated to air heated to a tem-

perature of from 144° F. to about 230° F. Bier found that the highest temperature that can be borne by the uncovered skin is 237.2° F. Apparatus of various kinds have been devised for producing this form of hyperemia. Bier's apparatus consists of various sized boxes into which the heated air is conveyed, by piping, and so constructed as to retain the hot air about the parts when inserted into the boxes. The apparatus is too expensive for general use. Equally effective results have been obtained by using an apparatus at once simple, cheap, and practical, a modification of Bier's, in which his wooden boxes are replaced by collapsible air chambers of cloth on frames. [The apparatus is described in the *Boston Medical and Surgical Journal,* June 24, '09.]

Bier, when experimenting with hot air, found that his arm became slightly and unevenly red after a prolonged exposure to air at temperature of 126° F.; if exposed to air having a temperature of from 144° to 212° F., the color of the skin became more pronounced, and with air heated to 237.2° F. (this latter temperature being the highest he could bear) the skin became bright red and evenly so.

The process of "baking" as the application of hot air treatment is often called, is not unpleasant, and when the bright red and perspiring limb is removed from the apparatus, dried, and dressed, the pleasant effect remains for some time. The surface thermometer shows an increased temperature in that part of the body which has been exposed to the treatment, for an hour or so after its removal from the apparatus. Besides the local effects of the hyperemia, there are general ones. Several patients after exposure of a knee forty minutes to air heated to 212° F. would sweat freely all over their bodies. In such cases the use of the hot air apparatus was advised just before bed time; immediate retiring safeguarded against cold or chill. A second general effect is a slight increase of bodily temperature, and some acceleration of the pulse rate.

In a case of anemia, secondary to malaria, in which hot air hyperemia treatment was given for a knee with chronic arthritis, the skin over the knee became marked with brown discolorations which followed the course of the superficial veins. This appearance followed after daily hot air treatment for three weeks. This discoloration was evidently caused by the disintegration of the red blood corpuscles by the heat; in this case the corpuscles were probably weakened by the malaria of several months' duration. Bier remarks that while such "marbling" looks ugly, we can assure the patient that it will disappear in time without treatment.

Sometimes in weakened patients, the treatment by hot air is followed by headache, exhaustion, and lassitude, and by palpitation. These unpleasant after effects are not common. They can be avoided in such patients, by applying a cold compress to the forehand during the treatment, and by avoiding the exposure of large surfaces to the hot air.

Hot air should not be applied for longer than one hour in the day. When applied for a period of seven or eight hours, it has produced an edema. This action of hot air is analogous to drug action, in which a small dose is beneficial and a large dose harmful.

During the menstrual period it is inadvisable to give the treatment. It can render the flow at that time excessive. In a case of chronic ulcer of the leg that was yielding nicely to hot air treatment, the writer was obliged to discontinue it on account of metrorrhagia. This case was a woman long after the menopause, who had suffered off and on for several years with flowing from the womb, which finally became so severe that ergot could not control it. Curetting was done, adenocarcinoma found, and the womb was removed.

Hot air hyperemia is used with beneficial or curative results in chronic rheumatic arthritis, rheumatoid arthritis (osteoarthritis), traumatic synovitis, sprains, lumbago, and neuralgias. The clinical histories that follow illustrate its efficiency.

CASE V.—*Chronic rheumatic arthritis.* Mrs. E., aged fifty-three years, a housewife, for twenty years suffered more or less with rheumatism of the left ankle joint. During the last five years of this period she had been quite crippled with it. The synovial membrane of the joint is thickened and roughened. Hot air hyperemia for an hour a day for a month completely relieved her. She has been enabled to go about and attend to her household duties for two years since, having but one relapse, which was quickly relieved by hot air treatment.

CASE VI.—*Rheumatoid arthritis of the knee.* Miss C., aged fifty-five years, a housekeeper. The right knee was enlarged and stiff for many years. Large cartilaginous masses, slightly movable, felt attached to the joint surface of the tibia. Motion of the joint painful and complete extension impossible. Hot air hyperemia in two weeks (an hour daily) produced marked improvement. She could straighten the knee, which she had been unable to do for sixteen years, and ascend and descend stairs with facility.

CASE VII.—*Traumatic synovitis of the knee joint.* P. K., aged thirty years, a teamster. He had been kicked by a horse in the right knee four weeks before consultation. Treatment during that time had been rest in bed for two weeks, compulsory because of the soreness in the joint. After that he tried to

attend to his business, but did so with difficulty. When seen there was considerable effusion into the joint, and a tender spot on the articular surface of the inner condyle of the femur, strongly suggestive of a perichondritis. Hot air hyperemia of the affected joint was produced for an hour daily. After six weeks' treatment, during which time the patient attended to his daily work, there was complete recovery.

CASE VIII.—W. W., aged forty years, a teamster. Two weeks before consultation he had stepped backwards off the tailboard of his wagon, and wrenched the right knee joint. Previous treatment in two hospitals (outpatient departments) without any improvement. Considerable effusion into the joint when seen. Hot air hyperemia daily for one hour was given (just before bed time, as this patient perspired freely all over his body after forty minutes' local application of hot air). After two weeks the greater part of the effusion was absorbed. and a localized thickening of the synovial membrane about the size of a kidney bean was felt on the upper and outer side of the joint sac. After four more weeks of daily hot air applications (an hour at a time), all the joint effusion had been absorbed and the thickened synovial membrane had considerably lessened in size and lost its sensitiveness. During the period of treatment he worked without discomfort.

Many other cases of traumatic synovitis could be reported here, the patients having been treated by the hot air method and cured, some in less time than in the cases given. After a considerable experience for sixteen years with the treatment of these injuries by splinting, rest, and various external applications, the writer confesses his belief that Bier's method is far superior to any or all of these in restoring the joint to its normal condition and at the same time permitting the patient to follow his avocation.

CASE IX.—*Fracture of the ankle bones.* Miss O'N, aged thirty years; weight about 140 pounds; tripped by high heeled shoes, fell down a couple of steps, breaking both maleoli of left ankle. Wood plastic splint material was moulded over both maleoli and lower third of leg. On the sixth day the splints were removed to permit of massage and careful movements of the joint. This was repeated daily, and after the tenth day, hot air hyperemia was produced for an hour daily, the intention being to remove the edema present and to hasten bone reunition. In six weeks the patient was allowed to bear full weight on the ankle and an excellent functional and anatomical recovery was manifest.

CASE X.—*Subacute rheumatic poly-arthritis.* Mrs. M., aged fifty-nine years, a housewife. About three months before consultation, she had had an attack of acute articular rheumatism, from which there was but little tendency toward recovery. Her condition when first seen was as follows: Her left hand, wrist, elbow, and shoulder were severely affected, the slightest motion of them causing extreme pain; the hand was swollen to twice its normal size, reddened, and very sensitive. The like joints of the right limb were likewise affected, but in a less degree. The right wrist and hand were exposed to hot air (about 200° F.) for twenty minutes; at the end of this exposure, motion at the wrist was possible without pain. Hot air treatment was applied to the shoulder, elbow, and wrist together, for a half hour in the morning and a half hour at night, for several weeks. Diet for the first two weeks, was limited to cereals, fruit, and milk; fish, eggs, and meat being forbidden. A teaspoonful of salithia in a glass of water was taken before breakfast. Ten grains of precipitated calcium carbonate, one grain of lithium benzoate, and 1-500 grain of colchicine were given in a glass of water two hours after meals, to increase elimination. About the fourth day of treatment a severe exacerbation occurred, due, inquiry revealed, to constipation. Thorough evacuation of the bowels was followed by marked improvement. The fourth week, tincture of iron chloride was administered, twenty drops, with water and glycerin to make a teaspoonful, given after meals. This was given for anemia, and with success. After a period of six weeks, hot air treatment being given almost daily, a complete cure was effected.

509 BROADWAY.

THE INDICATION FOR BIER'S HYPEREMIC TREATMENT IN ACUTE SURGICAL CONDITIONS.*

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Believing that Bier's hyperemic treatment is a valuable therapeutic agent in surgical conditions, I shall endeavor to briefly describe its mode of action and technic of application. Hyperemia is of two varieties, active and passive, the former being arterial, the latter venous.

Active hyperemia increases the supply of arterial blood to any part of the body, thus favoring absorption of exudates, infiltrates, adhesions, etc. As used chiefly in chronic conditions it does not come within the scope of this paper.

Passive, venous, or obstructive hyperemia is produced by means of a thin rubber elastic bandage two or three inches in width, better known as the Esmarch or Martin bandage. When this is applied, either directly to the skin or over a few layers of a soft bandage wound several times around a limb proximal to the part to be rendered hyperemic, the subcutaneous veins swell, the skin becomes somewhat blue and gradually an edema develops. The

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pulse is full and strong, the surface temperature is increased, in fact, the local evidences of inflammation appear to be increased in the hyperemic area. The hyperemic part must always be warm, and if the extremity is cold, the bandage is on too tight. There should also be absolutely no pain or parasthesia, and at all times one must be able to feel the pulse below the site of the bandage when it is properly applied. In acute inflammation, septic wounds and phlegmons the increased inflammation is apt to frighten the beginner, but this is a desired phase of the treatment. When the septic condition is overcome the swelling diminishes in spite of the constricting bandage. The weak points of this treatment in acute conditions are its injury in an overdose and its futility if administered in homeopathic doses.

As a Prophylactic Against Infection.

It cleanses the wound, produces a local immunization and a reaction before the infection has a chance to work; the earlier the bandage is applied the more remarkable is the effect. As an illustration, take the case of an incised wound of the hand with divisions of the muscles and tendons. If the tissues are not too seriously injured the muscles and tendons should be united and the skin closed with interrupted sutures sufficiently apart to allow free secretion; no drainage need be employed; a slight compressing dressing is put on; several hours later the elastic bandage is applied very lightly, producing only slight venous engorgement. In this manner the bandage can remain in place from eighteen to twenty-two hours per day.

The secretion, which is abundant, may be serous, sero-purulent or purulent. As soon as the symptoms of acute inflammation begin to subside the time of application of the bandage is reduced. If signs of progressive suppuration appear the wound should be promptly opened and the pus evacuated. Hyperemia will not produce a good result in every case, but it will, as a prophylactic, lessen the free incisions and operative after-treatment of infected foci. Compound injuries to the fingers and hand are also greatly benefited by this prophylactic hyperemia.

Acutely Infected Joints as a Result of Traumatism and Metastatic Empyema of Joints Following Acute Osteomyelitis.—Here again the sooner the bandage is applied the better will be the result obtained. The bandage should be worn eight to ten hours per day, and in the interval there should be elevation of the limb in order to reduce the edema. Usually the pain, which is the most pronounced symptom, will be relieved in a few hours, and then gentle movement of the joint is begun in order to prevent ankylosis. If pus is present in the joint, as evidence by puncture, the trocar or needle should be introduced and saline irrigation should be employed. If no improvement is seen under hyperemic treatment, arthrotomy and drainage must be resorted to.

Phlegmon, Cellulitis and Phlegmon of Tendon-Sheaths.—The obstructive bandage can be used in all of these conditions. For phlegmons of the finger, however, the suction glass is to be preferred. If used early this form of infection may be aborted. In dealing with phlegmon of the tendon sheaths—a most serious condition—the elastic bandage should be worn for eighteen to twenty-two hours per day. If, upon examination, pus is found, it must be evacuated at once.

The knife takes care of the pus, hyperemic treatment combats the infection. In cases of this type the employment of hyperemic treatment has rendered large incisions unnecessary. Several small incisions will accomplish the desired effect, with the additional great advantage of a better functional result. Drainage and gauze packing can also be dispensed with. During the entire course of the treatment gentle active movement of the fingers is insisted upon, as this will prevent the formation of adhesions between the tendons and their sheaths. In cases where necrosis of the tendons has already set in artificial hyperemia is helpless; it may hasten the process by more rapid pus formation, but it cannot restore life to dead tissue. In acute osteomyelitis, if the diagnosis is made early enough, and the elastic bandage applied eighteen to twenty-two hours per day, necrosis of the bone may be avoided. If pus is present it must be evacuated by a small incision.

In Acute Lymphadenitis of the Neck the elastic neckband is indicated. A strip of garter elastic is used three-quarters of an inch wide, with a hook at one end and a number of eyes at the other to allow for different degrees of compression. The band is applied around the neck below the larynx and it must never strangulate. The veins must be compressed so as to increase the quantity of blood in the head, but the hyperemia must not interfere with the patient's ability to sleep, eat or drink. The bandage can be worn from eighteen to twenty-two hours per day. A dusting powder, such as Bismuth subgallate, can be applied directly to the skin in order to prevent eczema. Here again, if the glands break down and an abscess forms, the pus should be evacuated by an incision and the wound cupped once a day in addition to the use of the elastic band.

Another method for producing hyperemia is by means of suction cups and glasses, this being better known as suction hyperemia. Cups of various

sizes and shapes are employed for this purpose and a few general rules can be laid down as a routine to follow:

(1) The application should not cause any pain.

(2) The cups must be sterilized after using.

(3) The rim should be anointed with sterilized vaseline.

(4) The suction should be intermittent and the cup should remain on for five minutes and off three minutes.

(5) Treatment should last about forty-five minutes.

(6) If an abscess is present or pus forms a small incision should be made.

Furuncles and Carbuncles.—If a suction cup be placed over a furuncle or carbuncle a red hyperemia will be easily produced, causing the tissues to swell and pus and blood to flow into the cup. This cup must be of sufficient size to extend beyond the inflammation. If applied early it will usually prevent suppuration. Diabetes is not a contraindication.

Abscesses.—Those of the axilla have been especially treated with gratifying results. Abscess of the face is especially to be treated thus, to avoid scars. Acute hymphadenitis of the submaxillary, inguinal and axillary glands also respond well to this treatment. Perhaps in no class of cases has suction hyperemia been used to better advantage than in *acute mastitis.* The treatment started as soon as the first symptoms appear, has saved a great many cases from reaching the second stage—suppuration. A supporting bandage must also be applied between the treatments. For the removal of the milk in cases of puerperal mastitis a small suction cup can be applied directly over the nipple. If pus is present it should be evacuated by making only a very small incision and then the cupping should be reapplied. The great advantage of hyperemic treatment is that the function and contour of the breast is preserved. In cases of acute olecranon and prepatellar bursitis the hyperemic treatment is applied as heretofore described.

Contusions or Black Eyes.—For this condition apply the cup over the eyeball and both lids. Within a short time the color of the extravasated blood will change, and if the treatment is applied four to five times daily the ecchymosed blood will rapidly absorb.

In conclusion, I wish to state that hyperemic treatment is of great aid to the surgeon, and its action is due chiefly to the bactericidal, nutritive-solvent and absorptive properties which it possesses and the great power it has to diminish pain.

92 MORNINGSIDE AVENUE.

LOCAL ANESTHESIA.

ARTHUR E. HERTZLER, M.D.,
KANSAS CITY, MO.

(*Continued from the August number.*)

FOR USE UPON MUCOUS MEMBRANES.

Cocain is no doubt the quickest and most certain of any drug in its action. That it causes contraction of the bloodvessels is in itself an advantage for examination in certain situations and for the treatment of certain conditions. If carefully used in small amounts the danger in its use is not great. Since the amount absorbed can never be definitely determined, it is well to heed the admonition of Wood never to exceed three-quarters of a grain by injection. We have placed the limit at one grain and have never experienced unhappy results after many years of constant use. Though the dangers in the use of cocain are very slight when used with the precautions above indicated, let it be repeated that they are never absent. For use in small operations about the mouth and face we still employ cocain. For extensive operations in these regions quinine has the preference.

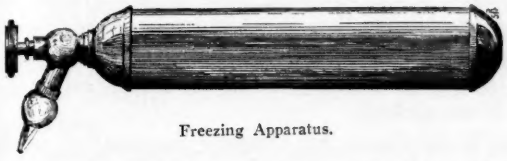
With the other drugs employed in local anesthesia the writers have not had an extended experience. There is a general agreement that they are less dangerous than cocain and also that they are less efficient. In efficiency and safety as well as in cheapness they are far surpassed by quinine and urea hydrochloride.

FREEZING.

Aside from the extreme limit of usefulness of freezing as a means of producing insensibility to pain, is the fact that when the tissues thaw out severe pain results, this quite independent of any pain which may be attendant upon the operation itself. The method has a certain use, however, but it is limited to the skin for small areas and for operations of short duration.

Methods. Refrigeration sufficient to make the skin insensible may be secured by means of *ice and salt.* The salt is pressed against the skin with a piece of ice the size of a walnut. After a few minutes the skin becomes insensible. This method has been used for simple punctures, as in thoracic paracentesis, in the absence of more suitable materials. For timid patients it has the advantage, as have all methods of freezing, that the anesthesia can be produced without initial pain. The fact that the patients suffer more from the thawing than from the operation itself is not a contraindication sufficient to prevent its use in such persons.

Volatile substances are usually used when it is desired to produce local anesthesia by the abstraction of heat. *Ether spray* used after the method of a freezing microtome may be employed. *Ethyl chloride* has been most used, however, and is preferable. This is placed upon the market in small containers (figure 5) fitted with a cap or valve which prevents evaporation when not in use. These containers are of such size and form as to fit the hand, the warmth of which, when the receptacle is grasped, hastens the evaporation of the chemical and thus the refrigeration. By means of this apparatus a small area of skin may be frozen in a few seconds. The proper degree of refrigeration has been reached when the skin becomes frosty. Freezing beyond this stage does not increase the anesthesia and may lead to sloughing. The instruments needed for accomplishing the desired therapeutic purpose should be previously arranged so that the necessary operation may be carried out without loss of time, since the duration of the anesthesia is very brief. The legitimate field for this mode of anesthesia is limited



Freezing Apparatus.

almost entirely to the opening of small abscesses or to the anesthetization of the skin preliminary to the making of a puncture of the needle for local anesthesia as recommended by Schleich. Here it serves a very useful purpose, since the initial pain of infiltration anesthesia is avoided. It may be employed as a preliminary to infiltration anesthesia or, conversely, infiltration anesthesia may be used to prevent the pain caused by the thawing out of the tissues after freezing. By the combination of these two methods it is possible to carry out painlessly, procedures otherwise very painful. Freezing should not be employed preliminary to incision where primary union is desired, since the freezing of the tissue so disturbs the vitality that primary union is likely to be interfered with.

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(*To be continued.*)

LEUCOCYTE COUNT WITHOUT A MICROSCOPE.

The practitioner is sometimes in need of an immediate white count when at the bedside and far from a microscope. Here is a quick, satisfactory and easy method by which it can be done in the patient's room and the result will be the same as if the counting were done through a regular microscope.

Draw the blood into a pipette, dilute with acetic acid and place a drop in the Zeiss counting chamber in the usual way. Now hold the cover slip on the counting chamber with a rubber band. The chamber can then be held up to the light and the corpuscles will not slide across the field. The counting is done with a small pocket hand lens. A sixty-cent lens will do, but there are more powerful lenses on the market that are hardly larger than a pea and are even better. A single frosted electric bulb gives the best light, but a lamp or most any single light will do. The knack of seeing the corpuscles and lines well enough to count them lies in holding the counting chamber and lens absolutely steadily in focus. This is easily done by grasping both with both hands so that the same fingers are in contact with both the lens and the counting chamber, thus preventing any tremor between them. Hold to the light and count. Occasionally a counting chamber is found on which the lines are not sufficiently distinct. The acetic solution should be filtered. It is easy then to tell white blood corpuscles from platelets. The reds cannot be counted in this way. —STERLING BUNNELL, in *The J. A. M. A.*

SURGICAL USES OF FRESH PINEAPPLE JUICE.

(Containing the proteolytic enzyme bromelin.)

While in furuncles the ideal treatment is incision, sometimes this is forbidden by the patient, as he prefers to suffer rather than have the knife used. Thus I have seen a yellow cap remain upon a boil for hours without solution and hold back the pus. Though the man was suffering agonies, he hesitated to face the bistoury. The application of pineapple pulp shavings invariably establishes free drainage within a short time. The yellowish and desiccated necrotic head is often digested promptly. . . . In cleaning up wounds pineapple juice will dissolve clots and render them more easily removed by the peroxide of hydrogen.—B. G. R. WILLIAMS in *Medical Record.*

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WALTER M. BRICKNER, M.D., Editor

NEW YORK, SEPTEMBER, 1910.

"606" THE NEW SPECIFIC FOR SYPHILIS.

Medicine is making long strides towards its two ideals—prevention and specific treatment. The latest, and in many respects the most remarkable, addition to specific therapy comes from that giant of experimental medicine and biochemical research —Paul Ehrlich. It is the synthetic arsenic compound, dioxydiamidoarsenobenzol dihydrichloride of Ehrlich and Hata, a single injection of a proper dose of which is reported to be as destructive of the spirochete pallida as quinine is of the plasmodium malariae.

It is interesting at this juncture to review the great and now fundamental discoveries in syphilis that have been made in the last very few years and to which Ehrlich's latest contribution is probably the crown. First of these was the demonstration by Schaudin of the infecting organism, the spirochete pallida. This was quickly followed by successful experiments in transmission of the disease to apes and rabbits and recovery of the spirochetes from the new host. Then came the Wassermann reaction—for which Ehrlich himself had prepared the way by his studies in immunity—a test of immense clinical value and of very great service to further experimental study. Meanwhile, Ehrlich had been patiently studying the effects of various arsenic compounds, evolved by him, on protozoon organisms; and he had produced several—among them atoxyl and arsacetin—which were distinctly antagonistic to these organisms but not free from irritating or even dangerous effects on human beings.

In dioxydiamidoarsenobenzol, the 606th preparation tried (and therefore given its, we hope only temporary, numerical title) Ehrlich found an arsenic synthetic very destructive to various forms of spirilla in animals. Iversen, to whom he gave some of the drug, reported to him from St. Petersburg that in human beings it was rapidly specific in relapsing fever (spirillum obermeieri). Ehrlich's observations with "606" had been limited to the lower animals; its serviceability in human beings he entrusted to the chiefs of certain clinics to determine.

The reports of these clinicians, covering nearly 2,000 cases of syphilis, are now appearing in the European medical press. Space does not allow us to review at length their clinical findings, nor their experiments in dosage, technic of injection, etc. For these details we refer the reader to the original reports by Wechselmann, Neisser, Michaelis, Alt, Loeb, Glück, Schreiber and Hoppe, Treupel and Fischer in the June and July issues of the *Muenchener Medizinischer Wochenschrift, Berliner Klinischer Wochenschrift and Deutscher Medizinischer Wochenschrift.*

While there is not complete unanimity on the by-effects of the drug, all these observers agree that it is not toxic to the human adult in doses of five to eight grains, and that it is a remarkable specific for syphilis. One reads, as in a romance, how, after a single injection, the spirochetes vanish in 24-48 hours, roseolae disappear, ulcers quickly heal, gummata no less than chancres soon fade and, usually, the Wassermann reaction early becomes "negative."

Only quinine can be compared to "606" in this reported rapidly specific action. But the usefulness of quinine in malaria was an accidental discovery and its employment has been empirical. "606" was evolved by a deliberate process of experimentation along definite lines. Those who will read (and reread) Ehrlich's two Harben lectures of 1907 will have an insight into the remarkable observations and even more remarkable theories on which this great man formulated his experiments.

In the nature of the disease, it may take a few years to determine that dioxydiamidoarsenobenzol is not only a safe remedy but a speedy and certain cure for lues. If the reports of these early observers are confirmed the treatment of the disease will be reduced from a tedious course of several years to one or two injections; we shall see less and less of

those extensive lesions now so common in surgical and neurological clinics; and in a generation syphilis—the scourge of centuries—with other spirilloses, will be practically extinguished! Our text-books will be many pages smaller!

Nor does the "if" seem very large. No other scientific remedial discovery presented with a weight of experimental authority even approaching that of Ehrlich, ever met the immediate and unanimous clinical endorsement that has been accorded "606," except Roux's diphtheria antitoxin—and diphtheria antitoxin is today an established specific.

With "606" specific for spirilla, quinine specific for plasmodia and antitoxin specific for diphtheria we may revive our hopes for the long-sought remedy or remedies that will destroy bacteria in the body without injury to the tissues.—W. M. B.

SO-CALLED CONGENITAL ABSENCE OF APPENDIX.

Every once in a while one may see an operation for appendicitis in which the surgeon fails to find the organ and closes the patient, and the case, with the observation that he has been dealing with "a congenital absence of the appendix." But the patient continues to suffer his attacks—because *he still has appendicitis.*"

Congenital absence of the appendix must be of the very rarest of human anomalies if, indeed, it occurs at all. In spite of a few reports of this condition we would be unwilling to accept as conclusive evidence of such an occurrence anything short of a minute *post-mortem* dissection. To be sure, it occasionally happens that neither the eye nor the finger reveals the appendix in any of its usual sites; but the explanation is not very far to seek.

In the August issue of *Surgery, Gynecology and Obstetrics,* Crossen reported two cases, simulating right tubal disease, in which in and about the cecum was an inflammatory mass completely burying the inflamed appendix. But it is not necessary that the cecum be inflamed or thickened to direct a search for the appendix in the cecal wall. The bowel may be entirely normal to the eye, and palpation may reveal no distinctive thickening; and yet we venture to assert that if the cecal serosa be incised below the ilio-cecal junction and an intelligent search made the "congenitally absent appendix" will usually be found. Care must be taken that a mere fold in the gut is not mistaken for an "interstitial" appendix; and, too, depending upon the peritoneal investment of the caput coli, the search may need to be retro- rather than sub-peritoneal.

There is another explanation to be sought for "absence of the appendix." Brewer, we believe, reported a patient who had been operated upon for appendicitis and no appendix found; subsequently coming into his hands for a continuation of the symptoms, Brewer found that the appendix was intussuscepted into the cecum. In 1903 Corner had collected 16 cases of intussusception of the appendix*, and a few cases have since been recorded.

Finally, one must bear in mind that an appendix may have been removed, unknown to the patient, through an unusual incision, as for herniotomy. But such instances of real absence of the appendix will probably not long puzzle the operator. In these cases, of course, the diagnosis is at fault and not the appendix.—W. M. B.

*Annals of Surgery, Vol. 38, p. 690.

Surgical Suggestions

It should be remembered that infection of the bladder mucosa is capable of producing symptoms of retention.

An intractable tuberculous cystitis that is not improved by silver nitrate most probably is associated with tuberculosis of the kidney, which causes reinfection.

For wiring bones iron wire is stronger than silver, and can be had at any hardware store.

No operation for hemorrhoids should be done without a thorough examination of the heart and abdomen to discover etiologic obstructive conditions.

If a patient with acute gonorrhea is kept in bed on a restricted diet, the saving of time in the cure will amply repay him for the confinement.

Vesical is differentiated from urethral fistula by the fact that in the former leakage is continuous or especially before urination, and in the latter leakage occurs during urination.

The filiform bougie is not used to good advantage if employed after the passage of a sound or large instrument, as splits of the mucous membrane are produced into which the filiform finds its way. It should be the first instrument employed.

Surgical Sociology

By Ira S. Wile, M.D.
Department Editor.

The Carnegie Foundation for the Advancement of Teaching deserves congratulatory thanks and approbation for Bulletin No. Four on "Medical Education in the United States and Canada." It is a valuable compilation calling attention to the various sins of omission and commission existent in medical educational institutions. Herein it essentially restates facts not unknown to the medical profession, long since actively engaged in labored endeavors to purge itself of existent evils and to eradicate its own educational blemishes.

Medical schools are too numerous. If the bulk of the medical schools are inadequate, society at large is more responsible than the profession. When the States can unite to pass uniform laws for educational standards of physicians and uniform laws of licensure for physicians, when faddists can no longer control legislatures, when State Boards combine reason with social purpose, groups of practitioners will be unable to create parasitic medical schools and these so-called schools, now existent only to exploit students and create professors, will cease to be. Society merits the best type of physician procurable and in the greatest number. At the present time society does not ask about previous education because it is itself at present far below the average educational standard of medical men. When society awakens to a realization of what constitutes the best type of doctor, there will be a large falling off of the unfit. One doctor to each 568 persons in the United States represents a glutted medical market. Medicine is the only universal, constructive, self-limiting profession. Its purpose is essentially social. The overproduction of physicians at least provides a more intelligent citizenship, tending to better civic health. The "superfluous doctor" is not always a poor doctor.

Speaking of surgery, the report rates its pedagogical value as relatively slight. Unquestionably the amphitheater is not the best place to learn how to perform every operation. It is a factor in teaching surgical cleanliness. It affords an opportunity for a surgeon-teacher, a rare person, to demonstrate modes of procedure, the use of instruments, the accuracy of diagnostic technic, pathological specimens, etc.

For clinical work a hospital is essential. "We have urged that the backbone of clinical training must be internal medicine," says the report. Therefore there is great regret that the bulk of our hospitals is given over to surgical cases. Most of the large hospitals in our medical centers have wards devoted to medical cases, and, when these are lacking, internal medical services should, indeed, be developed where undergraduate teaching is conducted. If most of our hospitals are chiefly occupied by surgical cases, the reason is not far to seek. Hospitals are expensive institutions to build and maintain, wherefore the best possible use must be made of them. Most of them exist for society as a whole and not primarily as factors in medical education. Only about 10 per cent. of the sick require hospital treatment, according to Osler. Many medical conditions have higher mortality rates in the hospitals than in the homes, and such cases should not be removed to hospitals merely to increase teaching facilities. Society is suffering from an insufficiency of hospitals of all kinds, but as long as such facilities are woefully inadequate, it has a right to demand that hospital care be given to urgent cases, to the results of industrial accidents, to all conditions that require the complicated paraphernalia of the operating room and the laboratories.

A large percentage of the patients admitted to internal medical wards is eventually transferred to the surgical department; and in the surgical wards there is an even larger percentage of cases that are on the borderline between medicine and surgery, or that have major medical complications or that in other ways present ample opportunity for medical diagnostics. The point we would raise, therefore, is that in hospitals where teaching is conducted or contemplated (and teaching should be the rule in many more hospitals than it is), and where there is lack of a suitable service in internal medicine the *surgical cases can be used to no small advantage for instruction in medicine.*

To physicians, who know no limitations of their hours of labor, much of the present day discussion in regard to the short day for the workers of the country seems to be merely an attempt to secure a larger part of the day for leisure without a willingness to have a reduction of the wages in proportion to the reduction in hours.

A consideration of the merits of the short day reveals the fact that society is the gainer in general health, strength, and wealth through the lessening of the number of accidents, incidental to all industries, but controlled in part by the duration of the work involved.

The legal aspects of the crusade for shorter hours has attracted far more attention than the humanitarian basis upon which a higher legality must rest. In the recent decisions, referring to the constitutionality of state laws that have restricted the working hours of women in special industries to ten in any one day, judicial notice was taken of the facts of common knowledge that tended to show that more than ten hours in one day is dangerous to public health. The Curt Miller case, in Oregon, and the more recent decision in the Illinois case have established new precedents for the consideration of legislation pertaining to hours of labor. The right of free contract is guaranteed by the constitution, but so is the right to health; and when the two rights clash, there may be a legal question raised, but there can be no moral question. When the right to health affects a large portion of the community, as it must when the hours of labor considered involve the workers in mechanical industries, for example, the public health becomes the paramount issue.

In the Illinois case the weight of the decision lies in the fact that full importance was placed upon the common knowledge that tended to show that "more than ten hours for women is dangerous to the public health, safety, morals, and welfare." The brief in this case is a splendid compilation of the literature of fatigue, arranged by Miss Goldmark, the publication secretary of the National Consumers' League. One is immediately struck with the wealth of material that has been gathered largely from medical sources and with the paucity of work relating to the subject that has emanated from the United States.

Physicians, sanitarians, physiologists, factory inspectors, insurance records, hospital statistics, all unite in establishing the fact that long hours of labor are conducive to an unnecessary and large proportion of industrial accidents.

The writings of men like Mosso, Wolff-Eisner, Roth, Tissiè, Celli, teem with illustrations of the unfortunate results of prolonged labor, owing to the development of fatigue. The theories of the origin of fatigue need not concern us at present. It is perfectly patent, however, that fatigue is of vast importance in the mechanical trades, where a nervous woman must be geared up to run all day, as long as a nerveless machine—and it requires no genius to appreciate which is the first to break down. Considering the loud cries of anti-race destruction heard, it appears sensible to further protect the women, and men workers, from the dangers at present inherent in the industrial system.

The bad effects of long hours on safety as shown in the incidence of accidents is of especial interest to surgeons. In brief, the greater number of accidents occurs in the later hours of the morning and in the latter part of the afternoon. In other words the period of greatest frequency of accidents coincides with the part of the day when the workers are fatigued and when muscles and nerves fail to respond actively to the external stimuli. Imbert and Mestre, studying the industrial accidents in France, found that "the number of accidents increases progressively from hour to hour during the first half-day. The number of accidents in the first part of the second half-day, after the noon rest, is noticeably less than in the final hour of the first half-day. In the course of the second half-day accidents become progressively more numerous with every hour. The maximum number of accidents per hour is notably greater in the latter part of the second half-day than in the latter part of the first half-day." The report of the Belgian Minister of Commerce and Labor for 1907 showed that in his country 72 per cent. of all accidents occurred in industrial establishments. He found the same distribution of accidents as far as the hours of the day were concerned. The German Imperial Insurance Department published in 1890 figures showing that 8 per cent. of the accidents occurred during the first two hours of work as compared with 21 per cent. that occurred during the last two hours of the morning. The first two hours of the afternoon gave 8.5 per cent. as compared with 16 per cent. for the last two hours of the day. Pieraccini and Maffei investigated the accidents incident to the work in the machine shops of the railways of Italy and found that there were 206.5 accidents in the second hour, 258 in the third, 324.5 in the fourth, and 323 in the fifth hour. The report of the New York Bureau of Labor Statistics, 1900, notes that accidents occur two or three times as frequently during this fifth hour as in the first hours of work.

Surgeons have an opportunity to make a substantial contribution to the subject of fatigue and industrial accidents. The when and why was a man injured can seldom be ascertained from hospital records and yet from the viewpoint of preventive surgery such information might be of the greatest importance. If long hours of labor are responsible for the congestion of our emergency hospitals let us know it and the cure will not be long in coming.

While there is an ever-growing movement to hold employers responsible for all the accidents that may occur within their shops, little thought has been given to the possibility of there being some physical defect of the employee which makes him more likely to be the victim of a seemingly easily prevented accident. The protection of the employer, and even more the protection of the employee, requires that workers in the mechanical trades or machine operators should undergo a physical examination previous to beginning the work, which may soon result in physical damage to the operator.

An examination of the report of the Physical Education Department of the Manhattan Trade School of New York makes this examination appear most necessary. Of 278 girls examined, 86 required glasses and 12 had defective hearing, while 5 had chorea, and 77 had other nerve signs present. The examinations of Public School children as reported from various parts of the country reveal the startling fact that 20 per cent to 30 per cent. suffer from defective vision and 5 per cent to 6 per cent. have defective hearing. These defects, as noted, are corrected in only a comparatively small percentage of the children, who go into industries at the earliest possible age, owing to the same poverty that makes it hard for them to secure the necessary medical care. To allow such boys and girls to work around belts, gearings, shafts, lathes, machines, etc., where quick vision and acute hearing are essential, is simply ignoring the basic principles of preventive surgery. The operative must first be adjudged as possessing the normal safeguards against accidents before he is allowed to take his chances with the protecting devices which may or may not be installed by the employer.

Imperfect vision and poor hearing are a great source of industrial accident, as well as the defects of speech on the part of employees who are in positions of authority. A sound body is the first essential of a workman who desires to remain sound. To lessen the chances of his injury, and for self protection, the employer should make a physical examination obligatory before engaging an employed.

Among the recently formed national organizations, none has attracted more attention than the American Association for Study and Prevention of Infant Mortality. The first annual meeting will be held at Baltimore, November 9th, 10th and 11th. There are to be four special sessions: Municipal, State, and Federal Prevention; Medical Prevention; Educational Prevention; Philanthropic Prevention.

The fact that one-fourth of the total mortality as recorded in the registration area occurs at or under the age of 2.68 years shows that a tremendous field exists for the labors of this new organization.

The program gives promise of much information on the subject of birth and mortality registration, a phase of statistical work that is fundamental and is still neglected.

It would be gratifying to note some study of the surgical causes of death during infancy and early childhood, but possibly they are negligible in the light of the immense mortality due to illness.

For information or circulars write to the executive secretary, Gertrude B. Knipp, Medical and Chirurgical Building, Baltimore, Md.

Book Reviews

A Text-Book of Pathology. For Practitioners and Students. By JOSEPH MCFARLAND, M.D., Professor of Pathology and Bacteriology in the Medico-Chirurgical College, Philadelphia; Pathologist to the Philadelphia General Hospital and to the Medico-Chirurgical Hospital, Philadelphia; Director of the Laboratories of the Henry Phipps Institute, etc. *Second Edition.* Octavo; 857 pages; 437 illustrations; a number in colors. Philadelphia and London; W. B. SAUNDERS CO., 1910.

The difficulty of expounding the entire subject of pathology within the compass of a volume of this size is well exemplified by a perusal of this book. It is only fair to state that the author, in his preface, recognizes this, and therefore logically plans his book to meet the requirements of those who merely desire to know the very essentials of pathological anatomy. We refer to students preparing for an examination. With this object firmly established, any criticism as to the completeness of the text, and *ergo*, its value as a work of reference, is at once disarmed, and our task resolves itself into the problem, whether the author has utilized the space limits at his command to the best advantage. This we can assuredly say he has. The text has been condensed in every possible way. Recourse to small type is frequent. A correct balance in the discussion of the commoner and rarer lesions has been well maintained. Facts rather than principles occupy the predominant portion of the text, while the larger problems in pathology and controversial matters are either summarized or entirely eliminated.

The author's views are thoroughly orthodox, the only innovation of any note being his acceptance of Adami's classification of tumors. A somewhat careful study of the text shows an acquaintance with the most recent pathological work. It is pleasing to note that McFarland gives credit to the authors to whose work he refers. The student should be made acquainted with the classic names in pathology. No references to the literature are given, however.

We have noted no very striking errors of commission and merely a few of omission. The more important of these are the following: The relation of bacteria and of previous attacks of cholecystitis to the formation of gallstones is not mentioned; the thyroid changes in Basedow's disease are not described; there is nothing concerning the relation of the chromofin system to Addison's disease, anaphylaxis or the differential diagnosis between lymphosarcoma and Hodgkin's disease.

The text, on the whole, is clearly written, but we note a rather unfortunate tendency to looseness of expression. For instance, on page 665, we find the sentence: "Cysts of bones are usually formed by softening, associated with hemorrhage or tumor formation, as in giant-celled sarcoma."

The illustrations are either photographs or cuts and indicate their purpose clearly. Those that have been borrowed from other sources have been selected with judgment.

Gynecological Diagnosis. By WALTER L. BURRAGE, A.M., M.D. (Harn.); Consulting Gynecologist to St. Elizabeth's Hospital, Boston, etc. Octavo; 656 pages; 207 illustrations. New York and London: D. APPLETON & Co., 1910.

The aim of this book is to furnish a guide containing only essentials, and "to give prominence to the common affections usually met by the general practitioner." This aim has apparently been kept in mind throughout, and in consequence this volume, on the whole, impresses the reader as elementary, devoid of individuality, and belonging in the fast disappearing class of text-books "with parallel columns of diagnostic tables." However, as long as students and practitioners continue to demand and to buy such works, authors and publishers will continue to supply them.

The volume consists of two parts, general considerations and special diagnosis. The text is well systematized, and the views expressed are conservative. We can hardly agree with the statement that "the Fallopian tube cannot be felt by bimanual examination unless it is thickened or enlarged by disease." In the description of pelvic cellulitis (which, by the way, in our experience, is not "a relatively rare affection"), extension of the exudation upward along the wall of the false pelvis and above Poupart's ligament has been completely omitted. Kraurosis vulvae is so commonly followed by carcinoma that this sequel might well have been mentioned.

The illustrations are good; most of them borrowed from well known sources, to whom due credit has been accorded. The care with which vesical and rectal diagnosis has been treated is commendable, and the chapters on childhood and infancy, and on the menopause are of value.

Nephrocoloptosis. A Description of the Nephrocolic Ligament and Its Action in the Causation of Nephroptosis, with the Technic of the Operation of Nephrocolopexy, in Which the Nephrocolic Ligament is Utilized to Immobilize both Kidney and Bowel. By H. W. LONGYEAR, M.D., Professor of Gynecology and Abdominal Surgery, Detroit Post-Graduate Medical School; Clinical Professor of Gynecology, Detroit College of Medicine; Gynecologist to Harper Hospital, etc. Octavo; 251 pages; 88 illustrations. St. Louis: C. V. MOSBY COMPANY, 1910. Price, cloth, $3.00.

In this monograph Longyear has gathered together the observations on this subject that he has reported in various medical journals and has amplified several aspects of his studies. The nephrocolic ligament, as first described by him, is, when carefully dissected, a firm fibrous band that extends from the perirenal fascia to the retroperitoneal aspect of the colon (ascending and descending, respectively). The band spreads out over the colon, to become lost in fine fasciculi in the wall of the gut and its peritoneal covering.

According to the author's observation, the mechanism whereby prolapsed kidney is produced, is as follows: Prolapse of the kidney is not primary, but results from prolapse of the colon. In Glenard's disease the colon (and particularly the ascending colon), becomes prolapsed. This gradually results in the prolapse of the kidney, from the tug on the nephrocolic ligament.

As regards therapy, medical treatment, according to the writer, has its scope. Longyear describes an abdominal pad that he has devised. The surgical treatment consists

in a dissection of the nephrocolic ligament; when the structure is freed, it is fixed to the lips of the lumbar incision after being drawn upwards. After operation the patients are instructed, not infrequently, to continue the use of the belt. In a large series of cases there has been no marked recurrence of the nephroptosis. *X*-ray pictures of the bismuth-filled colon have also shown that the colon has been held up as a result of the operation.

We cannot help viewing with some misgiving a "new" operation for nephroptosis, based on a "new" principle. Yet, if the discovery of the ligament is supported by other anatomical studies, the surgical procedure seems logical enough and it is well argued for by the author. However, with Longyear's theory, it is difficult to understand why movable right kidney should be so commonly met with, and the similar condition on the left side, so rare.

The book is profusely illustrated, the photographs and drawings are well executed, and to a high degree artistic. The binding and printing are neat and typographical errors are conspicuous by their absence. Altogether, the book will make very interesting reading for both the internist and the surgeon.

Précis du Traitment des Fractures par lar Massage et la Mobilisation. Par LE DR. JUST LUCAS-CHAMPIONNIERE, Chirurgien Honoraire de L'Hôtel-Dieu, Membre de l'Academie de Médicine; President de la Société Internationale de Chirurgie. Duodecimo; 267 pages. Paris: G. STEINHEIL, 1910.

It is unfortunate that personalities should mar so interesting a treatise, the work of the father of the treatment of fractures by early mobilization and massage. Throughout the first half of the book the author's ego is everywhere injected. He seems in constant fear lest he be robbed of some of the glory of the method of treating fractures, which is his. It may also be true that Lucas-Championnière has "sutured more fractures to date than anyone else in the world," but we can discover no sufficient indication for the making of such a statement. Those who have followed the literature of early mobilization and massage in the treatment of fractures will always accord Lucas-Championnière the pioneer's position in that field of endeavor. It was he who first called attention to the harm that may result from prolonged immobilization of fractured bones. It was he who also first demonstrated the value of massage and early mobilization in these cases.

The book consists, practically, in the description of methods of performing these maneuvers, and in a résumé of all the writings of the author on this subject. Although there is little that is new, one's attention is constantly held throughout the study of this volume, and not infrequently one is quite carried off one's feet by the enthusiasm of the author for his method. There is no doubt, however, that Lucas-Championnière goes a little too far in the advocacy of his method.

The volume is stocked with numerous wise observations, gleaned from a long and varied experience. For example, the author states that "crepitus is a sign of fracture that should be noted when it presents itself in the course of an examination, it is not a sign which should be systematically searched for. If deformity be present, the sign is useless. If there is no deformity, one's first indication should be not to produce it by violent manipulations," (page 67).

If it were only for such a significant paragraph as this, the book would be worth having. It is full of observations of a similar nature, and should certainly be in the possession of all deeply interested in fractures.

A Manual of Operative Surgery. By SIR FREDERICK TREVES, Bart., G.C.V.O., C.B., LL.D., F.R.C.S., Serjeant-Surgeon to H. M. the King, Surgeon-in-Ordinary to H. R. H. the Prince of Wales, Consulting Surgeon to the London Hospital, and JONATHAN HUTCHINSON, F.R.C.S., Surgeon to the Lecturer on Surgery at the London Hospital, Examiner in Surgery to the Royal University, Belfast. *Third Edition.* In two volumes. *Vol. II.* Octavo; 821 pages; 302 illustrations; 16 plates. Philadelphia and New York: LEA & FEBIGER, 1910.

The first volume of the new edition of this standard work was reviewed in the August, 1909, number of the AMERICAN JOURNAL OF SURGERY. What we then said of this book applies in good measure to the second volume. The style is clear and concise; the text is illuminated by excellent black-and-white as well as colored illustrations. The tendency to dogmatic statement, to the elimination of other methods of procedure than the authors' favorite ones, is as evident in this as in the previous volume.

The first portion of this book deals with the operations on the head, neck and spine. It is very complete except for the somewhat antequated portion dealing with the surgery of the brain. In the second part, dealing with operations on the thorax and breast, only comparatively little space is devoted to the methods of radical amputation of the breast. A comparatively large number of pages is devoted to the typical operations on arteries, veins and nerves—part three. Nothing but praise can be given for the splendidly written portions of the book dealing with amputations and with operations on bones and joints.

The second volume corresponds with the first in the excellent workmanship of binding and printing, for which the publishers deserve great credit.

A System of Operative Surgery. By various authors. Edited by F. F. BURGHARD, M. S. (London), F. R. C. S. (Eng.), Teacher of Operative Surgery in King's College, London; Surgeon to King's College Hospital, etc. In four volumes. *Volume III.* Large octavo, 764 pages; 381 illustrations and 3 colored plates. London: OXFORD UNIVERSITY PRESS, 1909.

This, the last of the four volumes to appear from the press is in many respects the best. It deals with operations upon the following regions, in the order named: For Tubercular Diseases of the Lymphatic Glands, by HAROLD J. STILES; The Spleen, by B. G. A. MOYNIHAN and HAROLD UPCOTT; The Thyroid Gland, by JAMES BERRY; The Bile Passages and the Pancreas, by A. W. MAYO ROBSON; The Skull and Brain, by L. BATHE RAWLING; The Spinal Cord and Canal, by W. THORBURN; The Kidneys and Ureters, by DAVID NEWMAN; The Bladder, by J. W. THOMPSON WALKER; Vesical Calculus, and The Prostate, by P. J. FREYER; The Urethra, by J. W. THOMPSON WALKER; The Male Genital Organs, by F. F. BURGHARD; The Breast, by HAROLD J. STILES; and the Thorax, by RICKMAN J. GODLEE. Like its companions, this volume is beautifully printed and richly illustrated with handsome original drawings.

In the reviews of Volumes 1, 2 and 4 we have sufficiently indicated the general character of this work, its commendable features and its defects. Taken as a whole, it is distinctly meritorious, but, as is always the case with "systems," the merit is not evenly distributed. Thus, as previously pointed out, the section on gynecological operations is, to say the least, very weak. A feature of the system that cannot escape criticism is evident from the list of subjects as above outlined for this volume, viz.: the bad arrangement of the topics. Such an irregular grouping—a veritable mélange—should not have been allowed, no matter what the delays with manuscript, illustrations or press work.

In spite of some decided defects, Burghard's system can be recommended as a handsome and compendious exposition of up-to-date operative surgery.

The Pathology of the Living and Other Essays. By B. G. A. MOYNIHAN, M. S. (London), F. R. C. S., Leeds. Small octavo; 260 pages. Philadelphia and London: W. B. SAUNDERS CO., 1910.

At the request of his friends, the author has collected these nine essays which have appeared in English medical journals. The object of the papers is to show how greatly the experience gained in the last few years at the operating table has increased our clinical knowledge. Previous to the era of abdominal operations experience could be gained only from post-mortem findings, and consequently terminal conditions only were recognized. The effect of this new means of ascertaining facts has been to decrease the group of so-called functional diseases and to show that "dyspepsia" in particular is most often a symptom of duodenal ulcer, cholelithiasis, or chronic appendicitis. With this increase in knowledge reckless exploration has been

replaced by ability to recognize conditions with sureness and at an early stage.

The essays are charmingly written, and contain an abundance of facts, and a fund of experience. They are to be recommended to both physician and surgeon for instruction as a means of acquiring a new viewpoint of the value of surgery in reference to internal medicine.

Nutrition and Dietetics. A Manual for Students of Medicine, for Trained Nurses and for Dietitians in Hospitals and Other Institutions. By WINFIELD S. HALL, Ph.D., M.D., Professor of Physiology, Northwestern University Medical School; Lecturer on Physiology and Dietetics in Mercy Hospital and Wesley Hospital, Chicago. Octavo; 315 pages; illustrated. New York and London: D. APPLETON & Co., 1910.

In this very interesting and readable volume Professor Hall has presented a concise manual of the essentials of nutrition and dietetics. It is, in short, the course on dietetics which he gives to medical students and nurses. It reflects modern notions on this subject as nearly as it is possible to present up-to-date views that are undergoing no inconsiderable modification. Menus are considered at length, but very little space is taken up by recipes, a short appendix of certain recipes, contributed by Miss Helen Hammel, being added. Dr. Joseph Brennermann has written the two chapters on Infant Feeding (in Health, and in Disease.)

Progress in Surgery

A Résumé of Recent Literature.

Foerster's Operation for Gastric Crisis. (*Beitrag zur Foesterschen Operation bei Gastrischen Krisen*). A GOTZL, Vienna. *Wiener Klinische Wochenschrift*, May 26, 1910.

Foerster's operation consists in resection of the seventh to ninth dorsal posterior spinal nerve roots. The author reports an especially aggravated case of gastric crisis in which this operation was performed. The symptoms were relieved almost immediately; the patient retained nourishment and promptly gained weight. Götzel gives a short review of the literature, which seems to indicate that this operation will become an established procedure.

Suprapubic Prostatectomy in Two Stages. HOWARD LILIENTHAL, New York. *New York Medical Journal*, June 18, 1910.

Lilienthal reports 16 cases without fatality. The ages of the patients varied between 52 and 77, the average being 71 years. Of 14 patients whose subsequent histories have been followed, all are well as far as the urination is concerned. Lilienthal believes that suprapubic prostatectomy in two stages is the operation of choice, inasmuch as it involves less shock—an important desideratum in these debilitated patients. Since the author advocated this method, five years ago, he has lost two patients operated by the one stage operation, performed against his conviction. It is interesting to note that in all the patients in whom the question was asked, potency was retained and in most cases increased. The loss of this function usually follows after the perineal operation.

Congenital Obliteration of the Bile Ducts With Report of a Case. ELIZABETH L. PECK. *Archives of Pediatrics*, June, 1910.

The symptoms in these cases begin soon after birth, and while there are variations in the course of the disease, the general resemblance is striking. From the ordinary icterus neouatorun these cases are distinguished by the more marked and persistent jaundice, the deeply bile-stained urine, and the usually colorless feces following stools or ordinary meconium. Very few of these babies reach six months of age. Death is preceded by emaciation, a deepening jaundice, sometimes vomiting and convulsions, and often by hemorrhage from various organs.

In the case reported, autopsy showed a small gall bladder, white and empty, with the cystic duct impervious. Other ducts were pervious. The liver was pale but normal in size and appearance. The lungs, kidneys and various other organs were jaundiced. Microscopic examination of the liver showed biliary cirrhosis with congenital obliteration of the bile ducts.

The Value of Thyroid Extract in Aural Manifestations of Myxedema. S. MACCUEN SMITH. *The Therapeutic Gazette*, June 15, 1910.

In two of the three cases where symptoms of myxedema were manifested, there was marked progressive deafness. In the first case there was distressing tinnitus aurum, in the second, frequent nasal and oral hemorrhage. The direct treatment of myxedema resulted in a complete cure of the nasal and aural symptoms.

Aural manifestations complicating Bright's disease are now frequently recognized, and may occur so early that they are only secondary to the ophthalmic picture in diagnostic value. The hemorrhagic infiltration into the tympanic mucosa, the failure to recognize high tones, the vertigo arising from degeneration of the labyrinthine nerve filaments, together with progressive tinnitus and deafness, due probably to edema of the sheath of the unditory nerve, produce a picture or train of symptoms almost as characteristic as those seen in albumimoric retinitis, which for a better name may be termed nephritic otitis.

An examination of the ear in the second case revealed little or no change from the normal. There was, however, a distinct hyperemia of the tympanic cavity which could be plainly seen through the translucent drum head. Indeed, the exudate confined in the tympanic cavity reminded one of a case of hydrops ex vacuo. In the third case, besides an edema of all the mucous membranes of the nose and throat, the membrana tympani of each ear was decidedly red and edematous, so much so that it was deemed advisable to incise it, which resulted in the evacuation of some serosaugunious fluid.

The deafness and tinnitus may be due to myxedematous thickening of the tympanic mucosa, or to the formation of myxedematous tissue at the base of the brain, where the eighth nerve is given off. In any event, the symptoms, both general and local, disappear as if by magic on the administration of thyroid extract.

A Brief Consideration of Some Intranasal Symptoms and Head Pains. JOHN J. KYLE. *Indianapolis Medical Journal*, June, 1910.

The points of irritation observed in head pain are more often the region of Meckel's ganglion, anterior prominence of the middle turbinate, lower turbinated body and the nasal process of the superior maxillary. This irritation may be due to hypertrophy alone, with or without contact and pressure from deflected septum. Headache from intranasal pressure may come on at any time in life and the pain is usually unilateral. The amount of pressure or hypertrophy necessary to produce head pains is, in many cases, very slight. Frequently persistent unilateral headaches have responded to cauterization of the lower hypertrophied turbinate, in which no evidence of pressure could be determined. Pain of this character is possibly due to increased blood pressure and exceptionally to augioneurotic edema. It may also be due to local or general faulty metabolism which may be chemical, bacterial or psychical.

These pains, which may be due to syphilis or general toxemia, frequently react to constitutional treatment. Pain in the fronto-temporal or fronto-nasal regions and behind the eyes is more often due to intranasal pressure from deflected septum or hypertrophy of the turbinates than sinus suppuration. Pain in the mid-orbital region frequently occurs from frontal sinus involvement or inflammation of the supraorbital nerve.

The Treatment of Malignant Disease of the Prostate Gland. J. B. BISSELL, New York. *The American Journal of Urology*, May, 1910.

From cases observed by him, the author concludes that carcinoma of the prostate generally develops to a late stage before features distinguishing it from the ordinary prostatic hypertrophy appear. Therefore, in the main, the treatment is not to be radical. The enlargement of the gland is never very marked until the spread of the disease from the prostate to contiguous structures has already made the diagnosis easy. Carcinoma may remain confined to the prostate for years, so slowly may it develop. Under such circumstances its presence is only accidentally discovered.

The choice of operation depending on the conditions found, lies between a suprapubic cystostomy with permanent drainage and the complete excision of the tumor with the surrounding involved tissues.

On Chronic and Synchronous Hypertrophy of the Lacrimal and Salivary Glands (Mikulicz's Disease). (*Sur l'Hypertrophie Chronique et Simultanée des Glands Lacrymales et Salivaires* (*Maladie de Mikulicz.*) P. SEJOURNET, Paris. *Revue de Chirurgie*, 1910, No. 7.

The writer reports a typical case of Mikulicz's disease and, in a study of the literature on the subject, finds other groups of cases that are erroneously classed with the disease first described by Mikulicz. The latter affection is characterized by a chronic and bilateral hypertrophy of the lacrimal and salivary glands. This hypertrophy involves the lymphoid elements normally contained in these glands. There are several (clinical) forms of the disease that are represented by the bilateral but dissociated hypertrophy of the lacrimal and salivary organs. The disease is to be distinguished from an acute affection involving these glands by its chronic course, lasting months and even years, by the absence of pain and of general symptoms. From speudo-leukemic conditions it is distinguished by the absence of other enlarged glands and enlarged spleen. In leukemia the blood examination is decisive.

The pathology of Mikulicz's disease is obscure. It seems to depend on some chronic infection. Its prognosis is good. The treatment consists in the exhibition of the iodides and of arsenic. The *x*-ray is reported to have given good results. In the cases of dissociated bilateral hypertrophy extirpation results in a definite cure.

Cécoplication and Cecopexy, as Complementary Operations to Appendicectomy. (*Caecoplicature et Caecopexie Complémentaire de l'Appendicectomie.* MAUCLAIRE, Paris. *Archives Générales de Chirurgie*, 1910, No. 6.

Many observers have noted that symptoms complained of by the patients are, not infrequently, unrelieved, even after the removal of a chronically diseased appendix. The symptoms are referable to many causes (ovary, colon, constipation, etc.), but the author considers one of the most common some disease of the cecum. He divides these cecal lesions into four groups:

1. Ptosis of the cecum—cecoptosis.
2. Exaggerated mobility of the cecum.
3. Cecal dilatation, either isolated or associated with the first or the second groups.
4. Dilatation of the cecum with atony.

A considerable number of instances of these conditions have been observed by Mauclaire, and have been treated either by cecoplication or cecopexy, or a combination of both, in addition to the removal of the appendix. The technic employed by the author is an anterior cecoplication and an anterior cecopexy.

Hemorrhages from the Male Urethra. A. RAVOGLI, Cincinnati. *The American Journal of Urology*, 1910, No. 7.

Excluding cases of hemorrhage in patients suffering with diseases of the blood, the author observes that urethral hemorrhage, although usually avoidable by the careful use of instruments, can sometimes not be prevented. Even the gentlest introduction of a sound may, in the presence of succulent mucous membrane, lead to an active hemorrhage.

When the hemorrhage has its source in the pendulous urethra a well applied compression bandage will control it. Digital compression on the perineum will usually control bleeding from the deep urethra, but urethrotomy and tamponade may be indicated, as in one case described by the author.

The Practical Value of Free Fascial Transplantation. (*Die Practische Ergebnisse der Freien Fascien-Transplantation.*) M. KIRSCHNER, Greifswald, *Archiv für Klinische Chirurgie*, 1910, Heft 92. Bd. 3.

Since Kirschner, of Payr's clinic, has experimentally demonstrated the feasibility of transplantation of smaller and larger segments of fascia, eleven cases have been operated upon at the clinic in which fasciae have been freely transplanted. These cases have in their results, supported the author's experimental observations.

The material was readily obtained by excision of the required portion from the fascia lata, in most of the cases. The fascia was excised down to the underlying muscle, and the skin simply sutured. In no case did a hernia of the muscle occur. In every case the transplanted section of the fascia healed in place aseptically. Furthermore, the transplanted fascia seems to have functionated as such in all the cases, there being no recurrences of the herniae before present, although the post-operative intervals are yet too short to make any statements as to permanent cure.

A Modification of the Scissors Operation for Splitting the Lower Canaliculus. T. W. CHARLES. *Annals of Ophthalmology, July*, 1910.

The ideal operation for a closed punctum should be one that first of all immediately removes any barrier to the flow of tears into their proper channel, i. e., produces such a punctum as would present an artificial lacus lacrimalis around the punctum, which will be turned toward or indeed rest upon the globe, and from which a canaliculus, as nearly as possible normal, pumps the tears.

This lacus lacrimalis is obtained by removing the hypertrophied conjunctiva down as close to the tarsus as possible on the temporal side of the punctum. This is accomplished by pressing the lid upward with the finger, so that the flattened blades of the scissors make a fairly deep bite. This method yields a triangular flap, instead of a simple vertical incision. This flap is then snipped off either by a vertical cut or by an incision somewhat similar to the first one, leaving a depression, at the bottom of which may be seen the beginning of the canaliculus. As the swelling subsides, this depression assumes the form of the normal punctum.

In the event of hypertrophy of the conjunctiva sufficient to cause ectropion, the lid is strapped up at its outer edge in order to temporarily relieve the ectropion as much as possible. Of course, the new punctum must be kept open by daily insertion of a probe until entirely covered with epithelium.

Depending upon the amount of ectropion, the vertical incision through the conjunctiva may extend backward almost as far as the cul-de-sac.

The operation is in no way intended to take the place of the more radical operations for ectropion, because there are naturally cases which would never respond to such a mild procedure, but it has been very satisfactory in relieving the stillicidium caused by closure of the punctum and beginning ectropion.

Anesthesia of the External Auditory Canal and of the Membrana Tympani with Ethyl Chloride Spray. C. J. KOENIG. *New York Medical Journal*, July 16, 1910.

The author uses the ethyl chloride container with a special tip devised by Schild, which is bayonet-shaped, so that a view of the drum may be obtained at the time of application. A very fine vaporization is obtained. Schild begins with an almost imperceptible vaporization until the patient feels a certain degree of coolness; then, very gradually, he increases the volume of the vaporization by opening the valve slowly, at the same time facilitating the

evaporation by means of an insufflation of air into the auditory canal with the Politzer bag. He usually stops the vaporization when the patient begins to complain of a slightly painful sensation, he then blows in a little more air and operates, the whole procedure requiring but a few minutes.

The author has modified and improved the technic in order to obtain an instantaneous anesthesia with an infinitesimal amount of the ethyl chloride. He has constructed an aural speculum with a small canal running the whole length of, and in the thickness of, its wall, and terminating on the edge of the funnel in an olive tip, on which is adapted a small rubber tube, the free end of the latter is applied to the operator's mouth. Air is insufflated with the mouth while the ethyl chloride is being vaporized. The evaporation takes place instantaneously, causing an immediate freezing of the drum.

Management of Severe Burns of the Eyes. HENRY G. LANGWORTHY. *Iowa Medical Journal,* July 15, 1910.

All foreign material must be removed at once. If flying lime has been the agent, flushing the conjunctival sac with an ounce of simple oil employed is at once indicated. Often in burns from quicklime, fine particles of lime become partially embedded in the corneal tissue and unless removed their escharotic action may be continued. With the eye as free from offending material as possible the important treatment is then instituted which consists in the instillation three times daily or every four hours if necessary, of a solution containing roughly atropin 1%, cocain .5%, incorporated in an ounce of pure olive oil. A heavy eye shade should also be employed and the patient kept as quiet as possible. The reasons for the employment of this almost universal mixture of atropin, cocain, and olive oil are: The atropin relieves eye irritation if the cornea be inflamed and tends to prevent secondary inflammation or irritation of the iris; the cocain relieves pain due to constant mechanical rubbing of sore and raw surfaces together and deadens delicate exposed nerve endings; lastly, the olive oil serves its purpose well as an emollient, protecting the corneal epithelium and has a tendency to check the formation of adhesions.

A New Method of Treating Exophthalmic Goiter. A Preliminary Report. MILES F. PORTER. *The American Journal of Physiologic Therapeutics,* July, 1910.

The injection of thirty to forty minims of boiling water into the enlarged lobes of the thyroid was tried on three dogs and one human being. There were, apparently no baneful effects. The patient, a woman, was injected with forty minims. There was no local reaction. She left the hospital a few days later and, now, after four weeks, seems in excellent health. At the last examination the right lobe of the thyroid was much diminished in size.

Fistula in Ano; Excision and Suture. E. C. BECK, New York. *Medical Record,* July 16, 1910.

Instead of allowing the wound to heal by granulation, Beck recommends suture of the cut edges after the incision of the fistula into the rectum. The author has employed this method in 17 cases, and all but one were discharged in one week entirely healed. As regards technic, Beck lays especial emphasis on the thorough removal of all scar tissue, and the application of tincture of iodine to the cut surfaces before suture.

Suture of the Faucial Pillars for Hemorrhage Following Tonsillectomy. R. H. GILPATRICK, Boston. *Boston Medical and Surgical Journal,* July 21, 1910.

In three cases in which Gilpatrick performed suture of the pillars for uncontrollable hemorrhage, following tonsillectomy, the method proved both feasible and efficient. Owing to the difficulty of tying knots deep in the mouth, the author obtains the required tension of the suture by mean of perforated shot. The method, briefly is as follows: The head is placed in Rose's position and a Whitehead self-retaining gag with attached tongue-depresser is applied. A fish-hook-shaped, round needle is threaded with black linen or silk, eighteen inches long. The point of the needle is carried behind the lowest portion of the posterior pillar and is introduced through both pillars. A perforated shot is then passed through the needle and the tail of the suture, and pushed back until the two pillars are forced together, when the shot is crushed. The suture is contained between the pillars until the angle is reached, when another perforated shot is applied as before. The author does not state how long the suture is to be left in.

A Contribution of the Etiology of Actinomycosis. The Experimental Production of Actinomycosis in Guinea Pigs Inoculated with the Contents of Carious Teeth. F. T. LORD, Boston. *Boston Medical and Surgical Journal,* July 21, 1910.

Organisms having the morphology and staining reaction of actinomyces have been constantly found in smear preparations (11 cases) and in serial sections (5 cases) of the contents of carious teeth from individuals without actinomycosis. They are present in such numbers as to suggest that they play a fundamental part in dental caries. Following the intraperitoneal inoculation of guinea pigs with the contents of carious teeth, omental tumors histologically identical with actinomycotic tissue and containing typical club bearing actinomyces granules have been produced in 3 of 5 animals.

Contribution to the Study of the Meiostagmin Reaction of Malignant Tumors. (*Beitrag Zum Studium der Meiostagminreaktion bei bösartigen Geschwülsten.*) S. VERSON, *Turin. Wiener Medizinische Wochenschrift,* July 28, 1910.

This method for the diagnosis of malignancy in patients was first described by Ascoli and Izar (see Editorial, AMERICAN JOURNAL OF SURGERY, May, 1910), who found it positive in 93 cases of undoubted malignancy. Since this report, D'Este has found the reaction positive in 11 out of 12 cases, Micheli and Cattoretti in 16 of 18, and Tedesco in 28 out of 29 patients. In Verson's hands the statistics are not so favorable: the reaction was positive in 10 out of 18 cases of undoubted malignancy. It was negative in 14 patients in whom the presence of a malignant tumor could be positively excluded.

The Treatment of the Dysphagia of Laryngeal Tuberculosis by Alcohol Injections into the Superior Laryngeal Nerve. J. D. GRANT, London. *Lancet,* June 26, 1910.

Based upon the good results following Schlosser's injections of alcohol into the roots of the affected nerves in tic doulereux, Hoffmann recommended injection of the superior laryngeal nerve for the dysphagia of tuberculosis. Grant's experience is based on six cases, which he reports, with satisfactory results. All were relieved of pain promptly, and up to the present (longest duration five months) are free from pain. For the technic, which is apparently not difficult, the reader is referred to the original communication.

Intestinal Diverticula. J. A. HARTWELL and R. L. CECIL, New York. *American Journal of Medical Sciences,* August, 1910.

This paper comprises a careful clinical and pathological study of eighteen cases of intestinal diverticula. The authors arrive at the following conclusions: 1. Diverticulum of the intestine is a common condition. 2. The large bowel is the most frequent site, particularly the descending colon and the sigmoid. 3. Children and young adults are subject to diverticula, and to the secondary changes occurring in them. 4. All diverticula are probably true in their incipiency. The false characteristics are the results of their growth. 5. An inherent weakness existing in the muscularis is probably an important factor in the etiology of diverticula. In the small intestine this weakness appears to exist along the mesenteric attachment. 6. Diverticula undergo the same pathological changes as the appendix vermiformis, and give rise to much the same general symptoms. These pathological changes are not uncommon.